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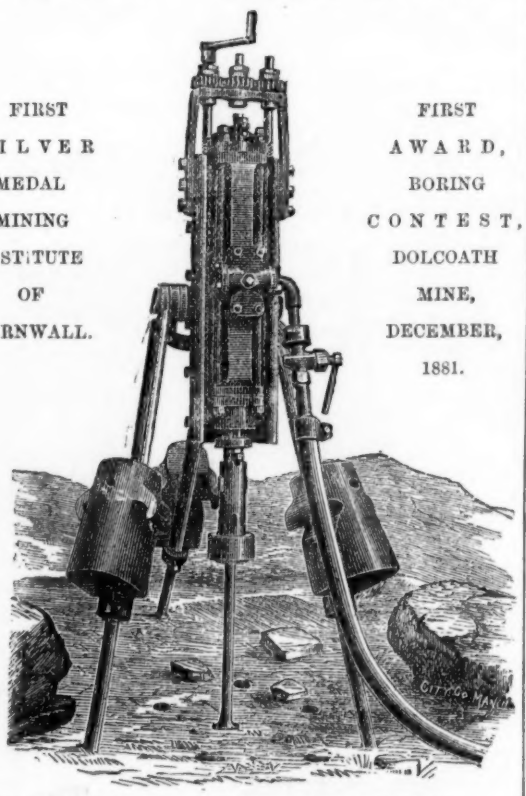

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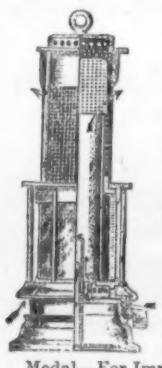

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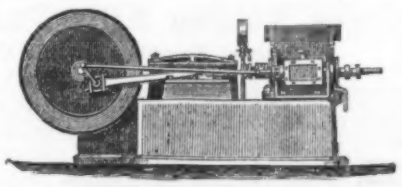

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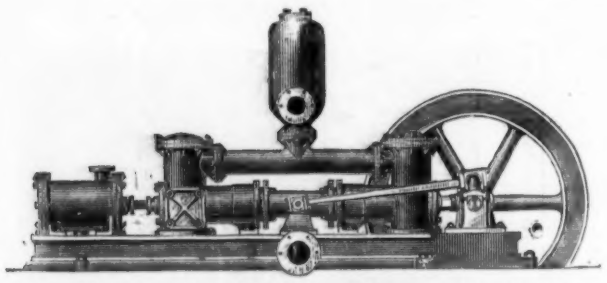

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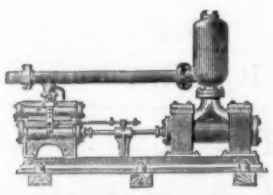

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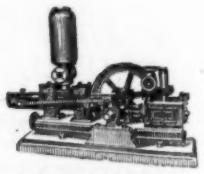

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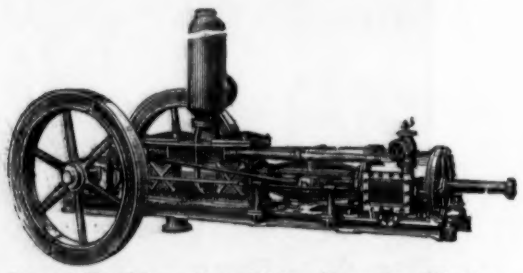

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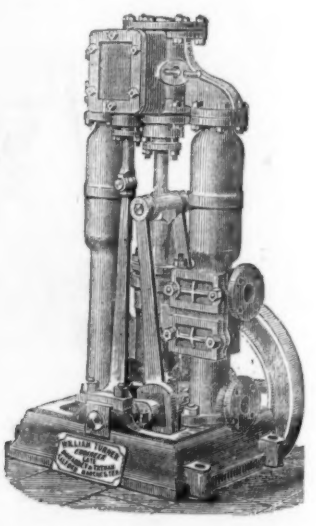

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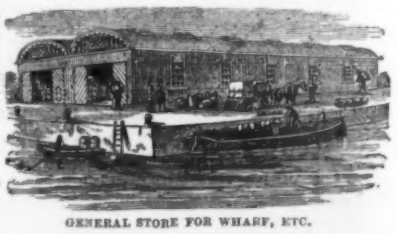

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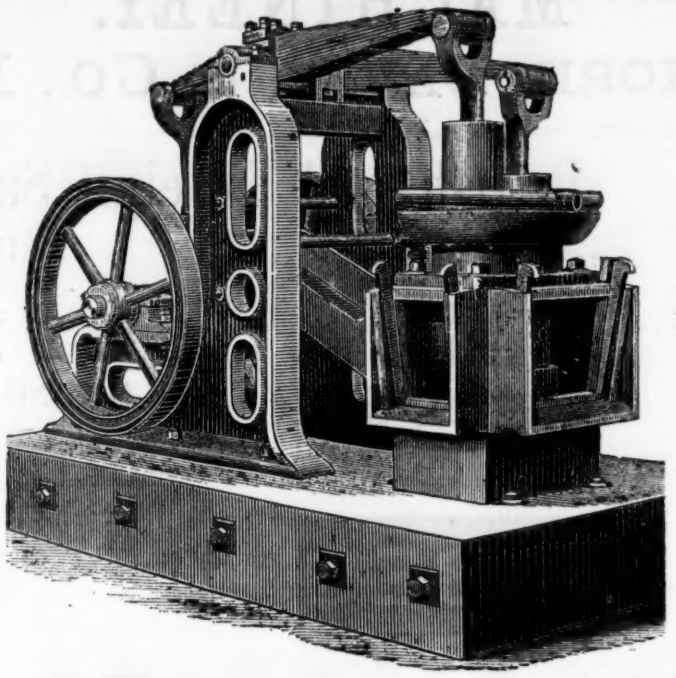

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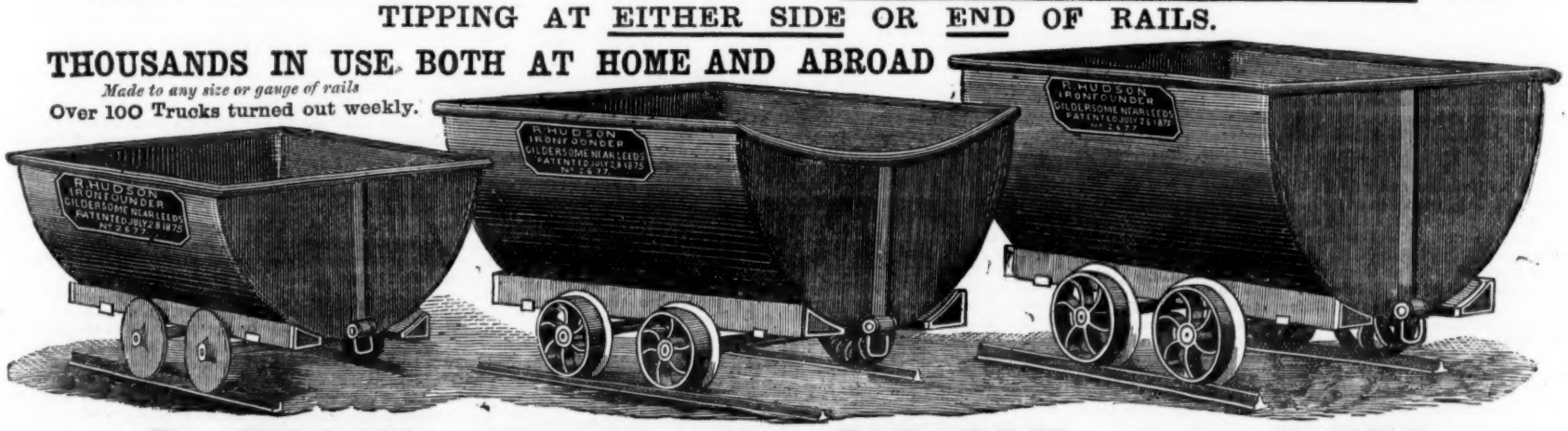

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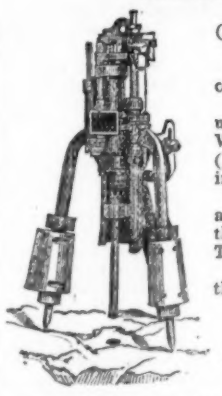

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APPLICATION.

Original Correspondence.

DYNAMIC FORCE—THE LAWS OF MOTION AS AFFECTING METALLIFEROUS VEINS AND PRODUCTS.

Sir,—My attention has been attracted by a letter which appeared in the *Mining Journal* of June 24 under the heading—"Discovery of the Most Important Law of Dynamics of the Nineteenth Century." I have perused and reperused the letter in vain in search of an enunciation of what the alleged newly discovered law is, or what it amounts to as affecting the science of mining or its economic results. Dynamics is said to be the motion of solid bodies produced by the influence of forces. Hydro-dynamics the motion of fluid bodies produced by the influence of forces. There were previously known three laws of motion. The first of which presumes inertia, and proceeds from that statical condition, thus—"A body once at rest will remain at rest unless acted on by some external force, and if moving in any direction will continue to move in that direction unless acted on by some external force.

2.—When a force acts upon a body in motion the effect of this action is the same in magnitude and direction as if it acted on the body at rest.

3.—Action and reaction are equal and contrary—that is to say, A cannot act mechanically on B without A itself being reacted upon equally, but in an opposite direction. What the fourth or newly discovered law of motion—dynamics—is, as affecting metalliferous deposits and defining their precise localities, it will be interesting to learn. The discoverer, Mr. J. Van Cleve Phillips, geologist, begins his letter by saying that "in 1847 he discovered a law by which the direction and amount of dip of stratified rocks in mineral fields could be known by an examination of the topography of a district." This it would seem is the discovery referred to, as the writer goes on to say—"Prior to this discovery geologists had supposed that the dip of strata in coal, iron, lead, and other mineral fields was accidental—the strata had been raised by a subterranean force and dipped at various angles from the point of fracture." This discovery showed that the dip of strata in mineral fields was the result of what might be called an intelligent or directed force, or such force as was in the acorn, and developed at regular distances as the branches of the oak, &c." From the above it will appear that the law in question—said to be an important law of dynamics affecting mining—could be known by an examination of the topography of a district. If I understand law in its relation to dynamics it means force—the application and effect of which distinguishes dynamics from statics, two essential branches of mechanical philosophy. By an examination of the topography of a district the effects of dynamic forces may be seen, but not necessarily, or even probably, the forces which produced them—the force of one effect being often itself the effect of another force or rather the secondary or transmitted effect of the same cause. The upheaval of igneous rocks I apprehend to be the effect of forces external to themselves, whilst the disruption of the superincumbent rocks are at the same time effected by the transmission of force from the same causes. If the dynamical effect of force is motion, by what other effects is it known, and from such effects what can be known of their cause or causes, or the laws by which they are actuated or governed. What are the known dynamic forces of subterranean nature whose action can and do produce motion, and continue it? Chemical agency cannot be regarded—contradistinguished as it is from mechanical philosophy—as dynamical are the undulatory forces—undoubtedly dynamical independent of chemical action in the effects they produce in the mineral kingdom and the rock structure which it inhabits. The dynamic force of heat of electricity of water—hyrodynamic—of attraction and repulsion. Motive and repressive forces acting and reacting equal and contrary in opposite directions, but of the essence of either how little, if anything is known, or of the laws by which they are actuated and governed, inferences may be drawn and theories formed from the effects they produce, but theory based on inference may be as remote from the truth as the antipodes is from earth's meridian. It is presumable that Mr. Phillips has failed to discover any new dynamic laws affecting the metalliferous vein formations, and deposits of what nature and kind soever, but merely a different being of ordinary phenomena, concerning which many persons might have something different to say. There is no appearance of any new law in the Professor's description of his pretended discovery—dynamical or otherwise—unless observation and recognition of phenomena may be said to be the discoverer of laws. That rocks may be grouped, and veins assigned family relations, is advantageously admitted and approved, their origin and end understood so far as the human mind, aided by erudite scientific acquisitions, is capable of penetrating and exploring such a vast and comparatively obscure arena—an almost *terra incognita*, but the discovery of a new dynamic law—so far as we are yet informed—is a matter concerning which different opinions may be reasonably entertained.

The family relationship of veins to each other, and to the rocks which contain and surround them, would be a much more congenial and profitable theme for discussion, both from a scientific and economical point of view—the latter of which, as practical men, we dare not lose sight of. That the dip of strata is discoverable by observation is no new fact, much less law; but that the precise locality of metalliferous deposits may be determined thereby is a novel doctrine, which will require in its establishment ample confirmatory evidence, much more than the illustration adduced—"The development of the oak from the acorn"—will exemplify or sustain. Is there any analogy between the development and growth of a tree from its seed and the operation of dynamic laws mechanically affecting the rock-shell of our globe? If there is I fail to perceive it, but that there is an analogy between the three realms of Nature—the animal, vegetable, and mineral—I have long since regarded and espoused, and have sometimes endeavoured to substantiate in the columns of the *Mining Journal* and elsewhere, but it is not here.

That Mr. Phillips seeks to promulgate his theory—law he calls it—in the interest of mining is obvious, and in that interest I venture to discuss it. The dynamic laws which affected the mining interests of the present time were operations of a past period, whilst those which affect the distant future may be in embryonic operation now. Nature works with regularity superior to horology; she winds up and unwinds with no external aid, and though in some instances, in many, the results are apparently abyssmal, they are in no case inferior to corrolative, one begotting or begotten of the others, so that perfecting changes and not destructive agencies are the handmaids and arbiters of her operations.

Heat, I take it, is the great dynamic motor in the mineral kingdom, but its offices and effects are limited, circumscribed to an area within its own province or domain. Water is subservient to its agency, and that again to its agency, so that each in contact begets or accelerates the power of the other. Fire, in a certain measure, decomposes water and intensifies its combustion, whilst in a different measure water neutralises fire and extinguishes it.

Whether stratified rocks incline from or to the igneous axes of mountains to which they may be situate depends not on the dynamic force which uplifted them, but on the nature of the igneous rocks themselves; if of granite, the inclination of the stratified rocks reposing thereon would be likely to be found inclining from the axis, such an upheaval is generally supposed to have been *en masse*, and in a more or less plastic condition with horns, or off shoots ramifying in different directions, whilst the plutonic rocks, from the greater intensity of heat to which they were subjected, would flow in liquified exuberance, overflow the surface and undermine the superincumbent mass on its margin—the margin of the dyke—from whose perpendicularity or inclination in an opposite direction the strata, under such circumstances aided by others, would sink towards the dyke and cause its dip to incline in that direction. Action and reaction in their dynamic relations appear to be convertible terms, which in reality they are, as any change in the direction of force would necessarily change the relations of material conditions subjected to its influence.

Upon what ground can it be assumed that a dynamic law affecting the formation and distribution of metalliferous minerals remained until now to be discovered? If dynamic force means the motion of solid bodies, motion comprehends its effects, and the result of it is all that we know of dynamics—force effective the opposite of which is statical immobile. I shall probably treat further of this subject in another communication, if time will permit. Robt. Knapp.

Ellsworth, Nev., July 31.

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GOLD AND DIAMOND FIELDS OF SOUTH AFRICA.

Sir,—By the last mail I sent you a plan of the celebrated Kimberley Mine, by Mr. Kidger Tucker, who is the most reliable draughtsman in South Africa. The illustrations surrounding it are not only amusing but are very instructive, and the position of the various companies are thoroughly to be relied on. I regret to say everything here is still very quiet. Otto's Kopje has come to grief, owing to the mercenary spirit of the promoters, bad management, and the low yield of the diamond soil. As the claims in this mine are only held under a monthly license, I presume they will again soon revert to the Government.

In the Kimberley Mine, the contractor, Mr. Jones, is getting on very well with the reef, and by the end of 1883 the reef difficulty will have been mastered, provided of course that they keep on removing it as at present. I see that the British and Standard Companies have at last acted on my repeated advice, and are sinking a shaft at the north-east corner of the mine for the purpose of keeping their claims clear of debris. The Standard Company's ground is very rich, and if they could manage to keep it clear of reef there would hardly be a better company in the mine. Even with the present price of diamonds their profits for the future must be very large. The Central Company are doing splendidly, and so are the Barnato and British. I am sorry to say the North-West Company have been obliged to stop work for want of funds. It will be no use their starting again unless they inaugurate a better system of management. With proper management the North-East would have paid very well.

As yet no other diamond mine has been found that will in any way compare with the celebrated Kimberley. But it is generally thought by men of experience that some formation equally rich has supplied the Vaal River with the beautiful stones found in its bed and on its banks. I have heard it whispered here that such a property has been found, and that a company is being quietly formed in England for the purpose of working it. I sincerely hope that such is the case, because a whole Kopje offered to English capitalists at a reasonable rate would do more to establish confidence in our diamond mining industry than anything I know of.

From the Transvaal there are very sensational reports. Two or three persons found a few patches of gold, but nothing in the shape of a lead can be found anywhere. Most of those persons who went to the new fields are returning without any gold. The Government organ of the Transvaal (the Volksstem) appears to take a rational view of the matter:—All sorts of sensational rumours still come in from the Kaap gold fields, but we refuse to circulate them before they are fully authenticated. In the meantime people are rushing off from every place in the country to the new diggings. Rumour has it that Pilgrim's Rest and Lydenburg are nearly deserted. From the Middelburg district numbers of people, farmers, and others, have gone, though there is a rumour that some of them have returned already. From Pretoria several parties have left already, and more are going to-day and next week. We shall soon have reliable information as to the character and prospects of these famous gold fields. Pending the receipt of such information we decline to give currency to mere rumour.

The latest to hand from Zeerust is to the effect that fighting has been going on again the day before yesterday at Montsioa's; the result of this heavy firing is not yet known. It is reported that Bethel with some 300 mounted followers has made his way up to Gaseitsioa's station, as it is getting too hot for him down that way. It is generally believed that Montsioa cannot hold out much longer now. The volunteers are carrying on fine games in that quarter. A man, the name of Reeders, was coming along the Pitzanie road with 230 oxen and two wagons, when some of these lawless freebooters rode up and quietly eased him of all he had, and threatened to shoot him if he dared follow them. The man, of course, was unarmed and therefore powerless. Such proceedings cannot be tolerated. Surely the Government ought to stop this sort of thing. Gaseitsioa has paid off all but 593*l.*, for which he has passed security on five wagons and five spans of oxen for 30 days, and so the old chief has at last been permitted to leave his prison and return to his native land. I expect he will take very good care never to return to the fertile plains of the free Transvaal again.

The antipathy of the Boers towards the English is of such a virulent character that it often blinds them to every sense of justice even towards their own people, as may be seen from the following from their own Government organ:—

It really does appear as if the obstinate majority in the Volksraad is fully determined to bring disrespect and ridicule from all well-meaning people upon the honourable body of which they have the misfortune to be members. We have more than once pointed out the absolutely wrong and pernicious system of annually submitting the list of officers to the scrutiny of a public body, whose members are not individually responsible for the due and efficient administration of the country's affairs. If the perversity and mischief of this system have ever manifested themselves as clear as the noonday sun then surely it was last Monday and Tuesday. Let our readers judge for themselves. On Monday the list of officers came on for discussion. They soon came to the item "Secretary to the Volksraad." If we are well informed the office was offered to the new incumbent while he was still in Holland, and that he, on the strength of this offer, came out with his family. But the Volksraad thought proper to erase his name as secretary, why, it is not stated, at least not by our reporter. We believe, however, it was only because the majority wish to retain the services of the present acting and eminently efficient secretary, and would have no objection to see the newly appointed secretary in some other office. This is therefore of minor importance; but what a sorry figure does the Government cut after this "scratching" process towards the man it has nominated as well as in the face of the world generally, which believes it enjoys the confidence of the people's representatives? The matter becomes worse, however. The name of the present Postmaster-General and Postmaster of Pretoria, with that of his assistant, was struck off, because, oh, horror! they had accepted compensation from the British Government! We ask, with all due humility, where is the law which prohibits an officer from accepting compensation from another, whether individual or Government, who has caused him damage? But further still, where will the majority of the Volksraad stop if this standard is to be applied equally to all? Are these two the only officers who have accepted "compensation" from the British Government, either in the form of salary or monetary grants? Let us start from the very top through all gradations to the very least official, and it will be found that there are very few indeed who can stand the test.

Kimberley, July 26. Correspondent.

A TRIP TO COLORADO.

Sir,—Having received several enquiries from people residing in different parts of England who contemplate making a trip to Colorado, and not having time to reply to all of them in detail, I trust that you will allow me to say through your columns for the benefit of those mentioned, and others among your readers who may desire such information that there are several first-class roads by which this region can be reached; but the most direct and at the same time most picturesque route is the Pennsylvania Railroad from New York to Chicago, giving travellers an opportunity of enjoying the charming scenery of the Alleghany Mountains, and of inspecting the immense iron and coal fields of Western Pennsylvania. On reaching Chicago tourists may at the same station take the famous Burlington route, either direct to Denver across the plains of Nebraska, or should they prefer to pass through Kansas City a branch of the same road will take them to that point, enabling them furthermore to enjoy the diversified scenery of Kansas and Colorado, the latter being exceptionally interesting for 150 miles along the base of the Rocky Mountains before Denver is reached.

Travellers, however, should remember that to avoid the trouble of frequent booking it would be better to secure a ticket in New York for the whole distance, which gives them the privilege of remaining in Chicago *en route* for an unlimited period, and baggage can be checked through to its destination without further delay. I may further say that the pleasantest time for visiting this country is during the fall months. At that time of the year the weather is exceedingly pleasant. The days are agreeably cool and the nights all that can be desired for refreshing sleep, continuing thus during the whole of the Indian summer. J. Fitz Brind.

Denver, Col., Aug. 4.

TOLIMA MINING COMPANY.

Sir,—There are no less than four distinct mining properties owne or leased by the above company—the Frias Silver Mine, the Organos Gold Mine, the Alto (Alluvial) Gold Mine, and the Sabandija Silver Mine.

1.—The Frias Silver Mine: Nearly all its working capital has been expended upon, and almost the entire amount of the considerable returns realised by this company have come from this mine, which is probably at present one of the richest silver mines in the world. I find that during the last three years the whole of the argentiferous ore exported therefrom has averaged 303·48 ozs. of silver per ton. The lode, moreover, appears to improve in width and richness as further depth is attained, and the existing reserves of very high grade ore laid open in the mine are greater, I understand, than at any former period. The last advices from the mine report a profit for the month of May of 725*l.*

2.—The Organos Gold Mine: This mine contains ore of from 1 to 10 ozs. of gold to the ton. But as it is situated, I believe, upwards of a hundred miles distant from the Frias Mine, the difficulty of the same staff supervising operations at different places so far apart from each other, together with the inadequacy of funds available for efficiently working both mines, caused this company some years ago entirely to relinquish operations at the Organos Mines. In the early part of last year, however, the steam navigation of the Magdalena River having only shortly before been carried to within a short distance of the property, the Tolima Mining Company leased this mine to the Organos Gold Mines (Limited), the latter company having been formed with a capital of 15,000*l.*, the whole of which was to be available for working this mine; and the vigour and success with which its operations have so far been conducted have already been manifested. A royalty of one-seventh of all the gold raised from this mine, or a sum of 20,000*l.* in event of the option of purchase being exercised at any time during the lease is payable by the Organos Mines (Limited) to the Tolima Mining Company.

3.—The Alto Gold Mine consists of alluvial gold deposits, situated on the extensive Frias estate. These have been proved to be of great richness, but there has not be sufficient capital expended upon their

working to secure large returns therefrom. The very small supply of water, which is of course the chief essential in an hydraulic mine, seems to have been the sole cause of the small returns hitherto realised from this mine, but it is worthy of remark that these returns appear to have been obtained at the low working cost of about 50 per cent. of the gross proceeds. If a small independent company were also formed to lease or purchase this mine, with sufficient capital to bring on an adequate supply of water from the Christalina river properly to carry on the washing upon these alluvial gold deposits I believe it would be greatly to the advantage of all parties concerned.

4.—The Sabandija Silver Mine: This is the only one of its mines not absolutely owned by this company. It was taken on a 21 years' lease about two years ago, as it adjoins the Frias Mine, and can be worked by the same staff at a minimum cost. It has not yet reached the position of yielding returns, but the following extract, which I have taken from last year's report on this mine indicates what these returns may be expected to be when the preliminary work of opening up the mine is completed:—"The vein along the bottom is 12 in. wide, yielding blende with lead and pyrites, containing red silver and silver glance, the yield of which as broken assayed 127 ozs. per ton, and after washing 342 ozs." A. Gray.

London, Aug. 23.

OOREGUM, AND ITS MANAGEMENT.

Sir,—I fear I must have made a mistake. I had imagined my anonymous critics (I use the word advisedly) were gentlemen; on reflection I conclude they are probably workmen formerly under my control. While reserving to myself the right to expose contradictions and false statements, I decline to reply to those who mistake impudence for sarcasm, abuse for argument, and misstatements for facts, sheltered by the flimsy veil of a *nom de plume*. Driven into a corner by the exposure of the fallacy of their views, every position they have taken up proved over and over again untenable, their report shown to be bunkum and absurdity, they, unlike honourable opponents, do not capitulate, but shout, throw dirt, and endeavour to enlist sympathy with their cause by abuse of those who have exposed the worthlessness of their assumed ability, and the absence of logic in their arguments.

Let them but prove the prospectus a just representation of the property, let them prove only that the statements made at the meeting in May, 1881, to have foundation in fact, just prove a single line of what I have written to be untrue, and I am willing to stand gibbeted before the opinion of the mining interests of the world; till then their attacks on me will be viewed by all honourable men as the mere outpouring of those who having nothing to advance by way of argument descend to the contemptible level of personality.

Penwortham, Aug. 20. F Kensington, late Superintendent.

NEW QUEBRADA COMPANY.

Sir,—In the Journal of Aug. 12 you gave a very interesting table showing the quantity of copper received from various countries and important mines during the years 1879, 1880, and 1881. This table shows the production in 1881 exceeded the production in 1879 by 7455 tons, or an increase of 5·4 per cent., a very small increase compared with the growing demand for copper. The smaller stocks and the higher prices now ruling confirm this view. In another part of the same Journal you refer to the increased production of the Spanish companies and the New Quebrada Company. This latter company shows the greatest progress of any of the mines in the list. The production in 1881 is 76·4 per cent. greater than in 1879, and the recent report of this company shows the output of ore during the first five months of this year is 58 per cent. greater than the large output during the same period in 1881, and as the reserves are also increasing there is likely to be a further increase in the output.

With an increased production the cost of extracting the ore has naturally decreased very materially. According to the Chairman's recent statement the cost in 1878 was 38s. 1d., in 1880 18s. 5d., and in 1881 15s. 1d. per ton. Unfortunately for the shareholders this increased production and lessened cost of producing has not yet added much to the dividend. It was 2½ per cent. for 1879, 3 per cent. for 1880, and 3½ per cent. for 1881. This comparatively disappointing result is owing to the increased profits having been nearly all absorbed by the Bolivar Railway Company, which conveys the ore from the mines to the shipping port. In 1879 the railway company received 37,000*l.*, and in 1881 52,393*l.* The New Quebrada shareholders have now, however, a much brighter prospect before them. Last year the railway company received more than its maximum fixed rate of 50,000*l.* per annum. The first 50,000*l.* of net proceeds from the sale of produce goes to the railway company, the next 5000*l.* to the New Quebrada Company, and all further proceeds are divided equally between the two companies. In the past year this fund amounted to 59,000*l.*, leaving 4000*l.* for division between the two companies.

The largely increased production of ore and regulus, the lessened cost of production, and the decided improvement in the price of copper, will this year give a very large addition to the sum for division between the two companies. An increased production, moreover, benefits the New Quebrada Company directly, as it receives a certain sum per ton of ore and regulus, before any payment is made to the railway company.

The shares in this company, now about 4½*l.* per 5*l.* share, rose in 1881 to about 7*l.*, partly in sympathy with the rapid rise in Rio Tinto shares. Messrs. Matheson and Company having so successfully developed the latter property, many French and English speculators looked for an equally rapid rise in the shares of this company, in which Messrs. Matheson and Company are also so largely interested. Investors who bought at the inflated prices must have been very much disappointed with the past results, but they may now expect to see their shares legitimately worth the highest price they have yet touched, and that before this time next year. In view of the results already obtained this year, the shares are now much below their true value. Aroa.

London, Aug. 24.

REFUGE PLACES IN MINES.

Sir,—The provision of refuge places in mines has, doubtless, done much to prevent that class of accident which led to their general introduction, and those concerned will I am sure be glad to improve them. The viaduct of the London and South-Western Railway, between Vauxhall and Waterloo, was a very dangerous section for the employees, and numerous refuge places have long since been provided in the parapet wall.

The great improvement introduced within the past few months consists in whitewashing them, and the result is most satisfactory. On the darkest night each refuge place is distinctly visible for a long distance, and can, therefore, be instantly found in case of danger. To whitewash the refuge holes underground would not cost twopence per hole per year, and would make them readily visible by the light of the poorest Davy lamp, and I believe increase the saving of life.

Hounslow, Aug. 23. K. J. L.

LEAD MINING IN CARDIGANSHIRE.

Sir,—For the past 18 months a great revival has taken place in this county, both in new and old mines, some of which have been started under the Limited Liability system with an enormous capital, to further develope a few of the old rich lead ore mines in this neighbourhood. Whilst local companies are busily engaged in exploring new lodes of great prospects, and working their mines in a systematic manner, such as the Bronfloyd, once worked by a limited company, and returned thousands of tons of lead ore, but came to grief under peculiar circumstances; it is now worked remuneratively by a local company. In the same valley lies the South Darren Mine, which is returning 50 tons of lead ore monthly, and the deeper they sink the more productive the lode is found. A little to the east is the Cwm Erfin Mine, which is at a standstill; but when last worked it was rich, and paid greater dividends for a longer period than any mine in the county. In the same valley we find the Old Bwlch Mine, renowned for its richness in a renascency state, now called the Bwlch United Mines, being in full work; 20 tons of lead ore is sold monthly, and the new dressing plant and machinery are capable of treating five times the quantity. The work is carried on in a spirited manner.

The massive rocks of silver-lead on the upper floors clear all doubts from my mind, and I have no hesitation in saying that they must have rich courses of lead underground. The Goginan Mine is on the same run of lodes west in the Melindur Valley. This mine has recently changed hands, substantial machinery erected, the mine partially cleared, and in course of develop ment, where it is expected large returns of lead ore will be met with. On the south side in the same valley a local company have commenced surface explorations on a well-defined masterly lode, producing splendid specimens of rich silver-lead and blende ores, which show great future prospects for opening out one of the richest mines in the locality. Next week I intend giving a few remarks on some of the leading mines in the southern direction. Well-Wisher.

Aug. 24.

LEAD MINES, AND THEIR PROSPECTS.

Sir,—It is long since I have seen anything so encouraging to shareholders in lead mines as the able and exhaustive article in the Times discussing the present condition of the lead trade, and as the depression has now been of long duration that encouragement is the more acceptable. It is very accurately remarked that the lead trade was the last of our important industries to feel the effects of the general commercial depression which set in some few years ago, and and it was not unreasonably supposed that a metal of such general application would be the first to improve in value when credit was re-established. For at least half a century the trade has not been in a worse position than during the last three years, in which it is estimated that more than one-third of the lead found in Europe has been sold at an actual loss to the producer. The profits of the smelters have been reduced to a minimum: and even the manufacturers, who convert the metal into the sheets, pipes, red and white lead, and other articles of commerce, have been forced to sell their products at prices which have left them little or no return.

In the production of lead Great Britain appears to occupy about the third place, for the relative quantities of lead produced in different countries are thus stated:—Great Britain, 54,000 tons per annum; Spain, 120,000; Germany, 90,000; Italy, 10,000; Greece, 9000; France, 15,000; Belgium, 8000; Austria, 6000; Russia, 1500; United States of America, 10,000; Australia, and other sources of supply, 3500 = 417,000 tons. The United States imposed an import duty of 9*l.* per ton on pig lead in 1864, since which time the American demand for it from Europe has been practically of no importance; and it might be added that America is rapidly rendering herself not only independent of outside supply, but also capable of forming an export trade. With regard to the lead produced in this country there can be no doubt that everything depends upon the question of supply and demand of lead, and that the writer in the Times takes so favourable a view is particularly gratifying, and shows that in some cases those in the trade are careless as to the true statistical position of the article in which they deal; hence the authority quoted says:—It is generally believed that the production of lead in Europe is in excess of the consumption. There is no evidence in support of such a belief. On the contrary, it is now evident that any over production has been absorbed; for stocks—that is, stores of lead ready for sale in this country and abroad—are admitted to be unusually low. When the fall in the value of lead commenced in 1877 it was supposed that, so soon as the market price fell below the cost price of production supplies would diminish. The market did so descend, but supplies, nevertheless, continued to increase, and from the middle of 1878 to the middle of 1880, the heavy production, coupled with the general depression of trade, made lead unsaleable sometimes at 13*l.* per ton. It must, therefore, be admitted that for a time the supplies exceeded the demand. Increased production with low prices, though apparently anomalous, is but a natural result. From an average lead mine, treated with due regard to the capital invested and its future working, lead cannot be put in the market under 16*l.* 10s. per ton. A lower figure would entail direct loss on the producer, unless he exhausts his mine by intrenching upon its reserves, in which case, by neglecting current explorations, repairs, and outlay upon plant, and by increased production, his cost price may be reduced to from 14*l.* to 15*l.* per ton.

When lead fell in value below 14*l.* per ton, the producer, whose former experience disposed him to look upon such a price as abnormal and as probably of brief duration, had two alternatives. It must be premised that lead mines are, as a rule, worked on a system of royalties; but a minimum rent is in most cases payable, even although the mine be unworked. He might first stop the working of his mine, with the inevitable certainty of future expense in re-opening it, and the risk of its caving in, and dismiss his staff of workmen, many of whom would be practically unfit for other occupation. He would still be under the obligation of paying a dead rent to his lessor, amounting in some cases to thousands of pounds per annum, and must absolutely sacrifice all interest on the capital which he had invested. Or, secondly, he might economise in every direction and distribute his expenses over an increased production by attacking the hard-won reserves left unworked from former years. It is not surprising that the latter course was generally adopted, or that relief was sought at the risk of ruining or depreciating the mine. Hence increased production came to multiply the difficulties of the producer, lengthening the period and the depth of the depression. The inevitable result has been that a large number of mines have been absolutely worked out, which cannot be re-opened without the expenditure of much time and capital. It is contended that, although the depression still continues, the production of lead in 1881 was not the sole or a sufficient source of the supply for consumption. An enormous decrease of makers' stocks in Spain is evident of late years, partly owing to increased railway and shipping facilities abroad, but principally to the necessity of realising to meet current obligations, which are always onerous on the maker in a falling market. It is plausibly argued that, as manufacturers' stocks in this and other countries have also decreased, the demand for lead has absolved not only the current supplies, but the additional amount thrown on the market by the reduction of stocks as well.

In the overstocking of the British lead market no country has played a greater part than Spain, and although it is quite true that many of the Spanish mines being wrought with British capital much of the profit realised falls to British shareholders, Spanish lead mining appears to be each year less profitable, although the same, or an increasing quantity of lead continues to be sent into the market from them, hence they prejudice home enterprise, and yield very inadequate interest to those who have provided the capital. With reference to this matter, the writer in the Times says that it is admitted that the depression of the lead trade has been largely contributed to by the possession of insufficient capital on the part of a large number of producers, by the banking facilities of obtaining advances on stocks held temporarily at home and abroad; and, finally, by the operations of speculators. Formerly the entire production of Spain was exported to other European countries as silver-lead. The silver was extracted, and the lead rendered marketable by long-established manufacturing firms, having large financial resources, and an extensive *clientèle*, well able to remain off the market, where is a slight demand. The Spaniards became dissatisfied, not without reason, at the lowness of the prices they received, and commenced to desilverise in Spain. They had a prejudicial effect, and a weak tone was imported to the market. Whatever the general effect of the policy may have been, it was soon found that in any given district of Spain the smelter who did not desilverise could not compete in buying his raw material from the native miner with another who did, and the lower the prices fell the more clearly was his position of disadvantage apparent. With supply and demand in equilibrium there is a marked difference in the control exercised by strong, as compared with weak, sellers on a market. The yearly requirements being 150,000 tons it does not follow by any means that the demand can absorb month by month 12,500, still less weekly supplies of 3000 tons. If the trade is in strong hands prices may be maintained over periods of slack demand, whilst the reverse must take place if the sellers are weak.

But the most encouraging part of the entire article is the concluding paragraph of it, in which it remarked, with regard to present prospects, that some hopeful signs are to be detected. There is, first, the absence of large stocks. The amount in this country of lead actually held back from the market is liberally estimated at 20,000 tons, or 300,000*l.* worth, against which there has been a large reduction of floating stock in the hands of manufacturers. Copper, with stocks of 35,000 tons landed in England, of a value of 2,400,000*l* has improved 10*l.* per ton in price during the last 12 months. Lead stocks, therefore, cannot be considered high, especially when it is remembered that the trade in it is nearly double that of copper. A second encouraging fact is the absence of any excess of production in 1881; a third is the increasing rate of consumption. Electricity is likely to become the means of creating a new and important demand for lead. The accumulator, storage or secondary battery, is said to be as indispensable an adjunct to electric lighting appliances as a gasometer is to those for generating gas. It is calculated that for each house lighted by from 20 to 30 electric lamps about 2 tons of lead will be required when secondary batteries are used. A demand may, therefore, arise here for thousands and hundreds of thousands of tons. The secondary battery, like electric lighting generally, has not yet emerged from the experimental stage. But already contracts have been entered into for a supply to an extent which absorbs 400 tons of lead per month—an amount not to be despised by the producer, when supply and demand are already supposed to be in equilibrium. Another and cheaper medium for what is popularly called "storing" electricity may possibly be found; but, so far as at present known, the only metals suitable for the purpose are silver, copper, and lead. Long before the demand is so great as to cause the price of the last to be equal to that of either silver or copper, the lead producer may look back with equanimity on the unhappy conditions of the quinquennial period which will terminate in 1882.

From low prices for ores, which have been almost invariably attributed to the existence of large stocks, large production, and comparatively stationary consumption, home mines have long suffered, and the complaint at every meeting of shareholders; the excuse of the Chairman for the non-declaration of dividends, or for the declaration of miserably small amounts, has been not the poverty of the mines, but the depressed state of the lead market. It would now appear, however, that this excuse will no longer be necessary, so that it may be hoped that before the end of the year the number of dividend-paying lead mines will be largely augmented. Miner.

Bakewell, Aug. 22.

MINING IN IRELAND—IMPORTANT SILVER-LEAD DISCOVERY IN GALWAY.

Sir,—In your valuable Journal of July 8 last when concluding the article on the above heading I promised at an early date to give you a detailed description of the discovery, situation, and future prospects, and as I am just returned home from opening the lodes up to view I feel much pleasure in handing you for publication my report thereon. This new mining property is situated at a place called Maam, which is 24 Irish miles north-west of the ancient town of Galway. The locality is very mountainous, and the lodes discovered traverse the mountain side, which slopes down to the shore of Lough Corrib, and at an altitude of from 80 to 100 fathoms above the lake. This is a magnificent lake, being over 30 miles in length, and in places three miles wide, and directly opposite the new discovery the lake is over one mile wide, and of sufficient depth for a large steamer to come close to the shore. The lodes run east and west and north and south, and some are caunter lodes; six lodes have already been discovered, all of which form junctions with each other within a comparatively small space of ground, and not many fathoms north of the great lead ore deposit now exposed to view, and there cannot be a shadow of doubt but at these intersections large deposits and continuous courses of ore will be found, and at no great depth from the surface.

The main or champion lode has a bearing of north and south, and has lately been opened on for 5 fms. in length by an opencast and 6 ft. deep. The lode will average 5 ft. wide, and its composition is rich gossan quartz, suggary spar, and elvan, and will produce for the length opened on fully 3 tons of silver-lead ore per fathom, and also carrying a solid rib of mundic 6 in. wide. Such a lode as this at surface I never saw before, and I doubt if many men ever saw such a lode at so shallow a depth; the ore is going down in solid ribs quite regular. A sample, 3 cwt., has been taken from this lode by me and sent to be exhibited at the Dublin Exhibition, the stones of ore varying in weight from 40 lbs. downwards, almost solid lead! where they can be seen by any person interested in Irish mining. This sample of ore will show the most sceptical that this is no bubble scheme, but a reality, and will also show that Ireland abounds in mineral wealth, and only requires capital to develope its mineral resources when good dividend paying mines will be the result. There is no need to send capital to open up foreign schemes where nine out of every 10 becomes a blank when we have good mines at home that can be opened up for a very small outlay, and become productive mines, and only a few hours' ride from England, and where shareholders can come easily and see the mines for themselves and see how their capital is spent. There is a magnificent east and west lode going into the very heart of the mountain, which is over 3 ft. wide, regular, and well defined. It is composed of flookan, decomposed killas as blue as indigo, quartz, and suggary spar, and carrying good spots of lead and copper ores and good stones of mundic. By taking up an adit on this fine lode and drive it about 60 fms. this great champion north and south lode as well as all the other five lodes will be intersected at their junctions, and only a few fathoms to the north of the great lead deposit, and will be over 20 fms. from surface, and I am satisfied if this was done lead ore in abundance would be met with long before the other lodes are reached; the lode is easy to drive, which is everything in favour of reaching the grand junctions as speedily as possible. I may here remark that only a few fathoms up the stream from this east and west lode there is a north and south branch from 6 to 8 in. wide, nearly solid mundic and lead, and this will junction with the last-named lode, only a few fathoms in advance of the point from where the proposed adit may be taken up, and I have no doubt on my mind that from this, the first intersection, we shall have a good lode all the way up to the main junctions and great ore body. The other five lodes are large, from 2 to 4 ft. wide of lead-bearing composition, and carrying good stones of lead ore and mundic, in places good work for lead.

The geological formation is a compact killas or clayslate, such as all our productive lead mines in Cornwall are found in, and require no timbering to keep open. Adits one after the other can be taken up as required, when backs of from 80 to 100 fms will be gained from the level of the lake. The facilities for opening out and working this mine cannot be surpassed. There is a splendid stream of water coming down the mountain close to the point of proposed adit, sufficient at all times for driving water-wheels and all necessary dressing machinery, but in the event of a very dry summer there is a natural lake or reservoir on the top of the mountain that can be utilised for very little expense, and dams or reservoirs can be made in the mountain gorge at almost any point, so that if necessary sufficient water can be collected during the night to dress the ore by day. A tramway can be laid down from the dressing-floors to the edge of the lake, and the ore can be put direct on board the steamboat that runs on the lake and taken up to Galway town, the freight being about 3d. per cwt., or 5s. per ton. Then the freight from Galway to Swansea, Cardiff, or Newport is only from 4s. 6d. to 5s. per ton (as ballast), so that the whole freight from the mine to the smelting works will only be about 10s. per ton, which everyone must acknowledge is exceedingly cheap indeed.

Now, Sir, taking into consideration the facilities for opening out and working the mine, seeing that no steam-power is required, with a magnificent paying lode in sight to the tune of 3 tons of ore per fathom, and five other masterly lodes all forming junctions, and each and all producing good stones of lead ore and mundic, I ask you and the numerous readers of the *Mining Journal* where such another new property can be found, and where can such prospects of early success be held out to capitalists for a small outlay? The property is held under license for 12 months to open on the lodes, with 1-20th royalty, and a lease for 25 years will be granted when asked for by the licensees. A Syndicate is about being formed by a Dublin gentleman, who holds samples for inspection at his office. This

property was inspected on the 11th inst. by a thorough practical mine agent, whose report will be published in the *Mining Journal* at an early date.

JOSEPH PHILLIPS,
Oola Hills Lead Mines, *via* Tipperary.

Aug. 19.

SHROPSHIRE LEAD MINES DISTRICT.

SIR,—The size of this district is only some five miles square at the most. It includes about 20 mine setts, all of which ought to be at work. A few of the mines last year (1881) produced near 6000 tons of lead and 200 tons of blende, and are likely to produce very much more in 1882. We fully expect Tankerville Great Consols to yield increased returns of both lead and blende, and we hear that East Roman Gravels is looking better. We do not know at what rate or speed the shaft at Roman boundary is being sunk, but expect they will not reach the desired depth in the present year. However, I see they are busy at the sinking and fixing of machinery, and their splendid prospects should stimulate them to all possible speed. What is wanted is a rise of 2*l.* or 3*l.* a ton on lead, and we think the prospect in this line is more cheering than it has been for the last three or four years.

MINER.

CORNISH MINING, AND MODERN MACHINERY.

SIR,—We have all been more or less interested of late years in the improvements in mining operations in this county, and are much indebted to our institutions which have so encouraged the invention of various kinds of machinery. The boring machine, for instance, has already and doubtless will continue to prove a great success in Cornish mining. Numerous other inventions, having regard to strict economy in working, which have been adopted will show that advancement is being made.

I have seen and heard much of late about Green's patent ore dressing machinery; but for a long time had not an opportunity of seeing and judging for myself the value or otherwise of this "German" method of ore dressing in this country. The recent erection of the machinery on Old Shepherds Mine, however, gave me the opportunity I had long sought, and accordingly I visited the mine, and succeeded in finding Green's machinery in active operation. It was working in a large and commodious wooden building, and on my first look into the interior I assure you I hardly knew at which to be most surprised, the wonderful skill displayed in the arrangement of such a heterogeneous mass of belting, shafts, pulleys, &c., or the perfect success with which the ore was sorted and dressed. Amid the tremenduous noise, jarring sounds, and convulsions of the buildings a great number of men and boys were at work to assist this "perfect automatic" machinery to dress the rich silver-lead ores found in the burrows (halvans) of this justly-famed and grand old mine.

Stopping my ears as best I may amid such a din I advanced further into the building to make a closer examination of its contents. To the left of the entrance there was a high-pressure steam-engine of about 8-horse power, which kept all this machinery in motion. To the right a 20-in. roll-crusher stood, supported on woodwork to about 4 ft. above the floor, driven by a belt so nicely adjusted as to slip off the pulleys if a stone larger than a walnut finds its way between the rolls (I presume this arrangement is patented). The crusher rolls are pressed together by ordinary levers about 9 ft. long, weighted with two winze kibbles and about 50 lbs. of scrap iron; a greater weight would probably cause the belt to slip off the pulleys or crush the ore too fast. The crushed ore is raised into a series of revolving sieves by an indiarubber belt, attached to which is a number of cast-iron buckets; this elevator will probably last three weeks in active operation. The ore passes from these sieves into numerous jigging machines, and then passes off into a kind of inverted pyramid, where by some ingenious method they are immediately separated into three distinct classes, which are treated simultaneously in three round minature buddles. If this part of the invention were adopted by the mines around Camborne I think it would effectnally settle the vexed question of tin dressing, and starve out the Red River companies in a very short time. I was informed that this very ingenious dressing machinery (assisted by ten or a dozen men) is capable of crushing and dressing from 10 to 15 tons of halvans per 24 hours, which, considering the very soft nature of the stuff will be very good work.

The machinery I find, however, is not new, having been erected on some other mines previously to Old Shepherds. As it usually answers so well and turns over such a large quantity of stuff per day the burrows are soon exhausted, or the machinery condemned or removed to some other mine, hence I would suggest that Mr. Green should mount his machinery on some kind of wheeled vehicle (patent or otherwise) on which it could be hawked from mine to mine intact; he would then find a large and changing field in which to display his ingenuity and dazzle the public, but I fancy he will not get a good practice in Cornwall until 1000*l.* worth of this machinery can be bought for 50*l.*, and he guarantee to keep it in repair gratis. I learn that Mr. Green says he can raise 1½ ton of silver-lead per week from the halvans. Now, as they have been working at Old Shepherds for something like 14 or 15 weeks—since Easter Monday—some 20 tons of silver-lead should be the result, but from all I can hear I very much doubt whether more than from 3 to 4 tons can be found to have been produced up to the present. There is a more gigantic scheme still at work further east in the valley, so that we may reasonably expect some larger results still in the future of ore dressing; they have two sets of crushers—one pair 24-in. and one pair 30-in.) and a large number of jigging machines and buddles, altogether covering about half an acre of land, and the whole of this is driven by a 12-in. engine; and, if I am creditably informed, Mr. Green has on two occasions made an attempt to put the whole of this machinery to work, but has hitherto failed through the breakdown of some portion or other of the gear.

Now, if your readers who are interested not only in reading about mining operations, but who have the providing and spending of the money, and are actively engaged in them can give us some little information for our future guidance we shall be grateful, and this letter will not have appeared in vain.

VISITOR.

Truro, Aug. 23.

CORNISH MINING—ITS MINERAL AND NON-MINERAL PRODUCING ROCK.

SIR,—To study the character of ground in selecting it for mining purposes is of the greatest importance to the practised eye, the difference between mineral producing and non-mineral producing rocks is easily descernible, but for the want of this knowledge much useless expenditure and consequent mining failures have occurred, whether the rocks be granite, slate, or elvan. Their hardest portions are always quartzose, and in these the lodes are seldom rich, probably because a hard rock is unsuited to the presence of metallic minerals or the lodes when traversing this quartz rock partake of its nature, and thus afford no place for the reception of other substances of greater value; but whatever be the cause the fact is pretty well ascertained, that the metallic contents of the lodes are effected not only by the mineral compositions of the contiguous rocks, but by their mechanical structure and positions also. In the richest districts we find patches of granite of an unfavourable character, which are known by their fineness of texture, almost resembling whetstone, and even of a much coarser nature, containing large and sharply defined crystals of felspar. It is equally unfavourable, but where the lodes pass through a rock which is neither very fine nor particularly coarse ground, the imbedded crystals of felspar being of a greenish or brown hue, and their extremities passing gradually into the basis of the rock, and that basis consists of greenish felspar besides the other ingredients—quartz, mica, and sometimes schorl—its character is considered very favourable, and one can state with a degree of certainty as to success or otherwise attending the development of lodes in such rocks. The varieties of elvan (porphyry) usually most favourable to riches differ slightly as regards tin and copper lodes. In tin lodes they are sometimes tolerably productive, even when split into strings of glassy quartzose elvan, whilst in copper lodes, unless the rock be soft and inclined to decomposition, the lodes split, dwindle, and become unproductive.

Cross-courses also form an important essential in the production of mineral, their absence being considered unfavourable as aiding the formation of mineral deposits. In some districts they vary as to distance. When they occur at great distances from each other the mineral is generally deeper, hence it is that many mines have been abandoned for want of capital to thoroughly develope them, when on recuscitation and further small outlay the richest deposits of mineral ever discovered in the county have been the result, under analogous circumstances. Suffice it to name a few mines—Tresavean, Great Consols United Mines, and at Devon Great Consols the old workers sunk to within 5 fms. of the grand prize and missed it.

St. Day, Scorrier, Cornwall, Aug. 23. CHARLES BAWDEN.

CORNISH MINING, AND NEW GROUND.

SIR,—For years I have advocated the working of new or unwrought ground, where we have such a vast amount of unexplored wealth, only as being the least expensive, less risky, and safest medium of investment, but that no enterprise pays like that of a rich mine. It is pleasing to see Killifreth come to the front after a long time. Only 14 months ago the shares could not be given away; indeed, the writer had 40 forced on him for nothing. I then strongly advocated it to my friends, many of whom took the advice and advanced the opinion that it had a great future before it. Yesterday's meeting declared the second dividend, making a gross profit divided among the shareholders of 2550*l.*, and the shares have risen to 6*l.* each, or 36,000*l.* for the mine since that short period. I now venture to predict another such mine within the ensuing 12 months will startle the public into "up and doing," situate in the very hotbed of mineral, having the desired cross-courses, elvans, and the lodes embedded into a rock proverbial for its mineral yield. At 40 fms. from surface for about 5 fms. long 500*l.* worth of tin has been raised and sold in a short space of three months. The same lode is being cut into at the 50 fm. level, or deepest point reached, where it is large (not yet through it), and is pronounced by those capable of judging as a great and rich course of tin; the specimens I have seen leave no doubt on my mind about it. This lode has given profits (and still continues to give profits) in the mines west of over a million sterling. Here there is another enterprise possessing all the elements of a great success; this opinion being justified by analogy to which practical mining authorities will ever attach great importance, having proved to be the safest guide in forming their opinions of the inherent value of mineral properties.

CHAS. BAWDEN.

St. Day, Scorrier, Cornwall, Aug. 23.

CORNISH MINING.

SIR,—A new era respecting mining is about to dawn on us; hitherto it has been the fashion to visit the workings below, and look them in the face, and if no lode, or a poor one, to condemn the mine, although there is a good lode, and a paying one, alongside not many feet distance, as in the case of Polcrebo; but fortunately for Cornwall and Cornish mining, this has stepped into the breach, and is determined to maintain its position, as in the wire question, so also in the mineral kingdom. It is a question of time, and a very short space of time will decide the correctness of my theory. I write because the main point in the Polcrebo Mine will be open to inspection before the expiration of another week, then it will be too late to write what everyone knows. In the former ceasing to work it was in consequence of the mine being poor, notwithstanding there was a lode of tin within arm's length worth more than 84*l.* per fathom 28 fathoms from surface.

Sir, it is quite time that this mine's bungling should cease. I am very pleased to find that Capt. J. Prisk, of Wendron, has secured the setts of Great Wheal Worthy, joining and to the south of Polcrebo, the large cross-course with the caunter, or Nine o'clock lode, as a secondary element in the latter mine will pass through the former, and I have not the least doubt will mineralise the east and west lodes many fathoms to the east of old and former workings, as in that day there was no notion of sexes in mineral veins, as my friend, Mr. Van Cleve Phillips, New York, pleases to designate my secondary theory. The secondary element affair with the dowsing-rod is rather a new feature in mining, but their laurels are sure to come—time, with a steady perseverance, is all that is required to bring them to a successful issue.

J. WILLIAMS.

Mining Directory Office, Hayle, Aug. 21.

CARN CAMBORNE MINE.

SIR,—It may not be generally known to your readers that this mine adjoins Dolcoath, the richest mine in Cornwall, lying, in fact, between that and South Condurrow, likewise a very rich mine. To those unfamiliar with the district in which these mines are situate, it might probably appear somewhat of an anomaly that Carn Camborne should remain poor, whilst its neighbours on either side were not only rich, but grew richer year by year. To those, however, who are familiar with the position of the three mines the cause was not far to seek. Carn Camborne is situate on an elevation called Camborne Hill, whilst its neighbours lie at its foot; it, therefore, follows that much more deadwork and a much greater depth was necessary in Carn Camborne in order to develope the lodes which have proved so rich in those mines, and which there was every reason to believe would be found at an equivalent depth in Carn Camborne.

It is gratifying to find that some most important discoveries have just been made in the 95, on the south lode, and also in the 40 west, which bid fair to establish the reputation of this mine as one of the best in the district on deeper development.

G. S. GREGORY.

Gracechurch-street, Aug. 18.

REPORT FROM CORNWALL.

Aug. 24.—There has been considerable apathy in the above market but no movement of any decided character, and prices generally are likely to be very much guided for some little while by the general conditions of the money market rather than by those by which mining may be supposed to be specially affected. We think this will be found in the main also to apply to individual cases, though of course it is impossible to make any definite prediction of the line which any mine may take. Still we do not seem to be dealing just now with a period likely to be marked by any notable exceptions.

It would be both a curious and interesting enquiry to endeavour to ascertain the accidental value which has been given to water rights in the county by the pressure of mines and clayworks, and the circumstances under which the rights have arisen. The public we believe have little or no knowledge of the merits of the case on which Mr. Pendarves is said to have obtained a perpetual injunction against the West Frances adventurers for making use of some water which he claims as his indefeasible right; but have not the adventurers a claim to be fully informed on all details, and especially to what extent, if at all, the operations of the mine will be affected? We seem to be rapidly approaching a time when the consideration of all the bearings of the present land laws and customs upon mining must be considered if any real progress is to be made.

It is not easy to understand on what principle the jury empanelled to enquire into the recent death of Charles Vial at West Basset came to the conclusion that the fatality indicated the need of some better means of communication between underground and surface. Nearly all the evidence went to show clearly that the means of communication was reasonably efficient, but the "accident," so called, arose from its being misused. If the miner Hocking had not, contrary to the rules of the mine, contrary to the expressly asserted caution of Cock, the skip filler, signalled to the whim driver, Vial would now in all human probability be alive and unhurt. It was Hocking's act, on the distinct testimony tendered to the jury, that caused his death. We acquit Hocking of course of any intention to do wrong, but there is such a thing as culpable carelessness, and it would have been more to the credit of the jury, and a wise precaution against similar "accidents" in the future, if Hocking had been put upon his trial for manslaughter. Cornish juries are, however, rapidly becoming a bye-word, and the matter can only now be left in the hands of Mr. Frecheville. We shall await his report with no little interest. We do not say the offence was one to be visited with any very severe penalty. Hocking probably is neither better nor worse—neither more nor less careless—than the most of his fellows. But that the death of Vial was *not* accidental, but the result of carelessness, and that Hocking was its immediate cause—unintentionally we again admit—must be apparent to anyone who reads the evidence even in the most cursory manner. What is the use of passing laws and devising precautions for the safety of life if they are not enforced? It is unpleasant to have to make such remarks as these, but it really does seem a duty in the simple interest of the safety of life and limb.

Is it too late to arrange for a full discussion on the present state of the mine labour question at the forthcoming meeting at Falmouth of the Miners' Association? The Mining Institute ought to have taken this up; but really that association seems to have dwindled into little more than a name. The subject is one that wants immediate and complete ventilation, for two reasons—first, because we suspect a great deal of nonsense is being talked and written about it; and, secondly, that when the real grievance is settled remedies may be discussed. One point that strikes us as specially important is the relation that tribute and tutwork should bear to each other, and the best means of reducing the "owners' account" men to the lowest possible minimum. There is nothing gained in cutting down wages if men really earn them, but, on the contrary, the energetic honest labourer is discouraged. There are cases in which a couple of well paid men will do more work than four or five underpaid ones, and low wages in such instances are a positive loss, however well they may look on paper. Cheap labour is rarely good labour. Another point to be discussed is the reduction of manual labour by the extension of machinery, in which direction, especially in regard to dressing, a great deal may be done. But we should like to see the whole question practically discussed from all sides.

P.S.—By a misprint, or a slip of the pen, the reference to South Condurrow in the final paragraph of the last report was made to apply to South Caradon. We wish we could speak in such terms of the latter concern, which, as a writer in last week's Journal so forcibly puts it, is really being sacrificed to "minelordism." There is, however, as yet no gleam of hope.

TRADE OF THE TYNE AND WEAR.

Aug. 23.—The steam coal trade continues very steady, and all the pits are well employed. Small and manufacturing coal continue to move freely off. The use of small steam coal, nuts, &c., is being rapidly increased for use in sea-going steamers. There is a good demand for Wallsend house coal in the coasting trade, and the shipments of this coal on the Tyne and Wear continue good. The demand for gas coal continues to increase, and this coal has also increased in value to some extent of late. Enquiries continue to come to hand outside of contracts for gas coal. There is a better enquiry from the Continent generally for coal of all kinds, and it is anticipated that immediately after the harvest there will be increased home demand, and a prospect of more remunerative prices being realised. The coke trade continues to show much vigour; there is a good demand for shipment, and also for the inland ironworks in this district, and also in the Midlands and West Coast. The house coal trade at home has been much depressed during the warm summer; but the autumn demand for this coal will spring up shortly, and a better demand for coal all round may certainly be expected. The fire-brick trade has been extremely good during the summer, and there has been a demand both in this country and abroad for all kinds of fire-clay goods, yet the prices realised generally have hardly been satisfactory. Some first-class makers have succeeded in getting fair prices, but these are exceptions. There appears, however, to be a tendency to increased value in this description of goods.

It appears that Mr. T. W. Snagge, who conducted on behalf of the Government an elaborate enquiry into the cause of the Tremdon Grange Colliery explosion, ascribes the ignition of the gas which had accumulated somewhere to an "outburst of gas driven with such force as to pass the flame through the gauze of the Davy lamp." He, therefore, concludes that these lamps give no security against such disasters, and that their use should be prohibited. It is curious that in these investigations the means by which the gas was ignited is always treated and spoken of as the cause of the explosion, which is quite absurd, as the cause of the explosion must of necessity have arisen from an accumulation of gas in the first instance, and certainly more attention should be directed to this point. There is no doubt that sudden discharges of gas have taken place, and explosions may have occurred in this way, but those are rare occurrences. The great majority of explosions occur from accumulations of gas in goaves, or neglected workings, or from the current of air becoming vitiated by the gas given off having proved too much for the quantity of air in circulation. In the investigation into the cause of the late explosion in this district opinions were divided as to the cause of the ignition of the gas, whether this occurred from the gas being forced through the gauze of the lamp, or from shot firing, and it appears to be very probable that some of them occurred through the firing of shots. If this was the fact the introduction of the lime process for bringing down coal in the place of shot firing is very important. It is also well known that an explosive mixture moving at or above 9 ft. per second will pass the flame through most of the lamps in use; it is, therefore, very important that improved lamps should, if possible, be introduced. But the main point still remains, that the accumulation of gas should, if possible, be prevented by more complete and perfect ventilation in all the accessible parts of coal mines.

The iron trade has continued quiet during the past week; the tone of the trade, however, remains steady, and makers hold firmly to late rates. The shipments for the first half of this month have been of a most encouraging character, having been much larger than usual. The manufactured iron trade in Durham continues to improve. The largest plate makers have an abundance of orders on hand, and the contracts are at prices that tend upwards. Orders have been placed for new vessels in these rivers and on the Clyde, which will give full work for a considerable period. Raw materials are cheap, and labour is not at a high price, and the rolling mills are making better profits. Prices have undergone little change. Ship-plates are 7*l.*; common bars, 6*l.* 5s.; and on Friday last the first arrival of salt from the Tees took place on the Tyne. Messrs. Bell Brothers are now producing about 150 tons of salt weekly, which is being sent to the alkali works on the Tyne. It is expected that before the end of the year this quantity will be largely increased. There is little doubt that the opening out of this important salt bed will have a considerable effect in the local chemical trade, which has suffered long and severely from depression. The producers of salt in Cheshire will, of course, keep the trade, if possible, and they are now endeavouring to get a reduction in the railway rates, with a view to reduce as much as possible the cost of their salt delivered on the Tyne. The local chemical market continues very steady, and there is a fair amount of business doing. Some forward sales have been made at a considerable advance in price, and altogether the trade has a better aspect. Alkali is considerably firmer, and there is a strong demand for soda ash, &c.

As the time approaches for the opening of the Marine Exhibition at Tynemouth the interest in it increases, although it was at first intended that it should be simply an exhibition of Marine architecture, marine engines, and all appliances for loading and unloading vessels, &c. The scope of the Exhibition has been gradually extended. There is no doubt, however, the original scheme will continue to be the leading feature of the Exhibition. Models of vessels of all kinds and of marine engines, and boiler cranes of all kinds used for loading and discharging vessels, &c., will be shown. There will also be exhibited marine and other engines of considerable size worked by steam. The Exhibition will be opened on Sept. 6. The total weight of the exhibits are estimated at about 1000 tons. The electric light exhibits will be very large and important, including all the most important companies yet formed for introducing the light. The Hammond Company will light part of the winter garden and upper terrace, &c. The Swan Company will light a ship's saloon erected by Walker and Emly, and will also light the upper machinery annexed. The Protector Lamp and Lighting Company will light other parts of the building. The various dynamo-machines will be driven by engines specially constructed for the purpose by Fowler of Leeds, Messrs. Robey and Co., Tangye Brothers, Birmingham, an "Otto" gas engine 50 indicated horse-power, &c. Patent gas lights will also be exhibited in great profusion.

In connection with mines and railways, the Wylam "Dilly" locomotive, constructed by Mr. William Hedley in 1813, will be an object

of great interest. This engine worked on the Wylam Collieries line from 1813 to 1862, and the contrast between this engine and the locomotive of the present day shows the marvellous progress which has been made during the past 60 years. The great merit due to Mr. Hedley for his invention in connection with the locomotive engine have only been recognised of late years, and he certainly did a great work in connection with this engine. The great Stephenson took up the work when Hedley left it, and, of course, the improvements effected by him were enormous, and they were also effected in a comparatively short time. The inaugural ceremony will be attended by deputations from Lloyd's Registry of Shipping, the Company of Shipwrights, London, the Institute of Mechanical Engineers, and the Institute of Civil Engineers. The various important industries of the North will be well represented, and there is no doubt that the Exhibition will prove of great benefit to this district.

On Tuesday a meeting of the Cleveland ironmasters was held at Middlesborough, and the question of continuing the arrangement between the Scotch and Cleveland ironmasters for restricting the make of iron was considered. The proceedings were private; it is, however, stated that both those parties intend to renew the policy of restriction on a similar plan to that which is now in operation.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Aug. 24.—Supplies of coke, both washed and unwashed, were rather more plentiful to-day, and they met with a fair demand. Coal of all descriptions was in over-abundant supply, and prices were unusually easy for the time of the year. Buyers sought to place winter contracts for forge and furnace sorts at present rates, and they were not wholly unsuccessful. Ironstone was generally pretty firm in price. Hematite ore was quoted 14s. 6d. at the pits, and Spanish ore 15s. at the ports. Local stone and coal prices were without change. Medium class pigs were the qualities that met with the best sale, and as to these distant makes, such as Derbyshire, Northampton, Leicestershire, South Yorkshire, and Lincolnshire were in larger proportionate demand than native makes. Yorkshire and Derbyshire brands of high quality were quoted 50s., delivered at consumers' works, while for the Thorncliffe brand 60s. was asked. Native cinder pigs were 42s. 6d. to 38s. 9d. as the minimum. The Spring Vale Iron Company have blown out their big furnace for repairs, which temporarily reduces the make in South Staffordshire 300 tons a week. The demand for manufactured iron keeps good. Nail rods were quoted 6*l.* 7s. 6d., delivered Liverpool. The output of hoops is increasing, particularly in the Walsall districts, and 6*l.* 15s. to 6*l.* 17s. 6d. and 7*l.* are the quotations.

At a special meeting of the South Staffordshire Mines Drainage Commissioners on Wednesday afternoon there was levied a general mines drainage rate of 1d. upon all minerals for the half-year ending June 30, 1882, payable on Oct. 1. Mr. H. H. Fowler, M.P., one of the law clerks to the Commission, stated that this 1d. rate used formerly to be worth 25,000*l.*, but that owing to depression of trade and consequent reduction of output by the mineowners it was now worth only 16,000*l.*

Some interest is being taken in a dispute between master and men at the Homer Hill Colliery, Stourbridge. Thirty-five men who have been in the employ of the Homer Hill Colliery Company sued their late employers at the Stourbridge County Court for a fortnight's wages each for having been dismissed without notice, and also for an alleged breach of contract. Counsel for the defendants intimated that it would greatly facilitate a settlement if the judge (Sir Rupert Kettle) would consent to intervene between the company and Messrs. Swindell on the matters which were pending between them. Sir Rupert consented, and the case was accordingly adjourned.

The colliers of North Staffordshire are agitating for an increase of wages, and are being considerably aided by local Trade Unions. A mass meeting held on Tuesday at Longton passed a resolution warning employers making contracts that higher wages were required in the immediate future. Decisive action is expected after the Manchester Conference on the 29th inst.

The Sandwell Park Colliery Company held its 13th annual meeting at the Queen's Hotel, Birmingham, on Tuesday. Mr. J. Bissell presided, and moved the adoption of the report, which recommended the payment of a dividend at the rate of 7½ per cent. per annum, absorbing 4926*l.*, and leaving a balance of 4365*l.* to be carried forward. After some discussion, chiefly upon the form of the accounts and the advisability of paying a higher dividend, the report was adopted, and the retiring directors re-elected.

TRADE IN SOUTH WALES.

Aug. 24.—It is rather remarkable that, with a strike of "tippers," lasting three days, at the Cardiff Docks, the amount sent away was not less on the whole week, being 110,553 tons foreign, and 17,487 coastwise; Newport, 29,944 tons foreign, and 19,992 coastwise; Swansea, 22,068 tons foreign, and 10,217 coastwise. A return just made shows the wonderful increase of output in the various collieries of South Wales and Monmouthshire. The number of collieries worked in Glamorganshire last year (1881) was 289, against 298 in the preceding year; the output was 15,987,516 tons, against 15,519,362 tons—over 300,000 more than 1880; though, as will have been seen, there were nine fewer collieries in operation. In Brecknockshire there were the same number of collieries (five) at work in 1881 as in 1880; but the output there again showed a substantial increase, the figures being 102,642 tons, against 99,750 tons. In Pembrokeshire eight collieries produced 79,153 tons, against 79,500 tons in 1880—a slight falling off. Carmarthenshire, with 47 collieries, produced 652,025 tons, against 625,750 tons in 1880, with only 33 collieries. It will be remembered that the anthracite coal largely predominates in this last county, and that it has been subject to sudden depression and unfavourable fluctuations. The highest price realised for coal at the pit's mouth was 13s. 4d. per ton; lowest, 5s.; average, 6s. 7d. For slack the highest price given was 5s. per ton; lowest, 1s. 8d.; average, 3s. 8d. The statistics here given have no bearing whatever upon Monmouthshire, respecting which the following particulars may be added:—Number of collieries in 1881, 124, against 103 in 1880; output, 5,412,840 tons, against 5,039,750 tons; highest price per ton realised, 8s. 6d.; lowest, 6s.; average, 6s. 10d. For slack the highest figure reached was 5s. per ton; lowest, 2s. 9d.; average, 4s. It is hardly necessary to state that in Monmouthshire house coal is a conspicuous industrial factor.

It will thus be seen that South Wales and Monmouthshire raised about one-seventh of the entire output of the kingdom, which was valued at 65¼ millions of money, leaving 11 millions for the value of the rest of the minerals raised. It may here be mentioned that Messrs. Crawshay are in treaty for 2000 acres of coal in the Rhondda Valley, called the Newbridge-Rhondda Colliery. The following seams are known to be—if the word be permitted—comeatable in this colliery—Nos. 1, 2, and 3 house coal seams; Abergorky, 2 ft. 9 in., 4 ft., 6 ft., one yard vein, 9 ft. seam, "Dirty Vein," Gadlys, and lower 4 ft. seam. The present company have already secured the coal under the following farms:—Gellywion (house coal only), Penrhiw, Llwynpla, Tirarlwydd, and Pencoedcae, with the option of taking also Coedcaedu, Penbwch, and Gellydraws farms; for the coal beneath them cannot be worked except from the little valley of Gellywion, in which the Newbridge-Rhondda Colliery is situate. There are two pits, one to be used as an air pit and the other as a winding pit. The depth of the latter is 200 yards, where it enters the celebrated No. 3 house coal seam. The No. 1 seam was struck in the pit at a distance of 65 yards from the surface, and the No. 2 is at the usual depth between it and the valuable No. 3 seam, which was the seam which, during the first half of the present century, made Dinas coal so celebrated in the coal markets of the world. The great fault, known to geologists as the anticlinal, runs from east to west across the centre of this valley. There are two collieries in the valley—the Rhondda Junction, with a taking of about 1200 acres, and the Newbridge-Rhondda higher up the valley. Now, the anticlinal fault runs between the two collieries. The Rhondda Junction seems to have been sunk on the north-east edge, hence the many disappointments experienced by the company, who sunk the shaft 284 yards in depth.

Although the attempted sale of the famous Plymouth Works resulted in failure last week, it is said that Mr. Thomson Hankey has determined to push forward some of the works as well as keep the collieries in operation. The unworked coal upon the estate is estimated at 46,049,400 tons, and the property also comprises considerable undeveloped beds of iron ore. The Plymouth furnaces, five in number, Pentrebach puddling furnaces, and the Duffryn blast furnaces, a residence for the manager, six dwelling-houses for agents, 11 farm houses, and 293 cottages are included in the property; and the Glamorganshire Canal Dock in Dumball's-road, Cardiff, and the Box Bust Iron Mine at Coleford, Forest of Dean, are also held as adjuncts to the works. This correct description, as given by Messrs. Farebrother, Ellis, Clark, and Co., will show how vast was the undertaking of Messrs. Fothergill, the collapse of which helped to put Merthyr Tydfil under a cloud for years. The Dowlais Works have been kept going during all the depressed times, and the Cyfarthfa Works are about to become once more a scene of activity by their conversion for the manufacture of steel. When in full swing it is estimated that there were no less than 25,000 men employed at these three works. The iron and steel trade is at present pretty brisk in this district, and some parcels have been sent away from Newport as follows:—Montreal, 2000 tons; Santos, 571; Calcutta, 350; Guadaloupe, 156; Smyrna, 135; Gijon, 80. Iron ore has come in at Cardiff to the extent of 7573 tons from Bilbao and 1563 from other places; Newport, 11,800 tons from Bilbao and 2730 from other places. The price is still about 15s. per ton. Tin-plates, coke made, stand at from 16s. 6d. to 16s. 9d. per box, and from 19s. 6d. to 20s. for charcoals. The land is being marked out for the new Roath Dock, and the freighters are proceeding with their Barry Island scheme.

IMPORTANT SALE OF A COLLIERY.—The steady profits derivable from colliery working has frequently been noticed as more than compensating for the higher percentage of profit obtainable from successful metalliferous mining, and this argument is especially applicable when the colliery is taken over as a going concern at a time when temporary depression or the necessity for, perhaps, a small additional amount of working capital. The Flint Colliery, which is to be offered for sale at Chester on Sept. 11 by Messrs. Churton, Elphick, and Co., will afford an opportunity of testing the accuracy of this view. The colliery is about half a mile from the town of Flint, with branch railway and sidings to the main line of the Chester and Holyhead Railway, in full work, and now raising from the Brassey, Thick coal, and 5 ft. seams, about 800 tons of good steam and house coals per week, which may be largely increased. In addition, there is the Cannel seam partially worked, and the Lower Four-feet seam intact. The coal mines, under a surface area of about 820 acres, are held under lease and take-notes for terms having upwards of 18 years to run at minimum rents, amounting together to 360*l.* per annum, recoupable out of royalties, which are moderate. Exemption from all claim for surface trespass on 9 a. 3 r. 24 p., comprising the site of the colliery and branch railway, has been purchased. There are three shafts all geared for winding, and fitted with three high-pressure winding-engines, and one 100-horse power pumping-engine, with seven steam boilers. The colliery has always enjoyed a good local sale in Flint and the neighbourhood, and as there are several large manufacturing works near, and excellent facilities for supplying the Birkenhead and other markets, it would appear likely to afford a good field for enterprise.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

Aug. 24.—There is no mistaking the fact that trade has decidedly improved of late in both the coal and iron industries, and there is every prospect of this continuing. At the coal mines the men are much better employed than they have been for some months past, but with this improvement there has been no appreciable increase in the price of coal itself. A much larger tonnage of coal is being sent from the leading collieries to London than has been the case for some months past. Clay Cross has been sending fully 400 tons a week to the Metropolis, and a large quantity has also been sent from Eckington, Grassmoor, Blackwell, and Langley Mill. The Great Northern is now doing a large business on its new line between Derby and Nottingham, and cultivating the trade in that direction in preference to its old field of South Yorkshire, which is so much farther from the Metropolis. The coal mines in the adjoining county of Nottingham have been doing particularly well of late, sending a heavy tonnage southwards. The docks at Sutton Bridge, made by the Great Northern Railway Company for the shipment of coal, have now been all but completed, and it is expected that the colliery owners will take advantage of them for the exportation of their steam coal, but a good deal is expected from the provision now being made at Boston, which is much nearer than Sutton Bridge. Steam coal has been going off tolerably well of late, principally for the railway companies and ironmakers away from the field of coal. A large quantity of ironstone continues to be imported from Northamptonshire, and in return coal for the furnaces at Wellingborough, Glendon, and Market Harborough are taken. The iron trade is in a healthy state, and the limitation of production in Cleveland and Scotland is of course making it better for other inland districts in particular.

In Sheffield trade gets better more than otherwise, especially in the heavier branches. At no time, indeed, has more been doing than at the present time in plates for ironclads, as well as in those for ship-builders and boiler-makers. In the cutlery branches, too, there is more being done in the best description of table knives, as well as special quantities suitable for the requirements of the Continent and South America. Bessemer rails are not in such demand as they have been, and makers of that description of steel are now paying more attention to the production of special qualities suitable for tools and cutlery. In South Yorkshire there is some little agitation going on in favour of limiting the production of coal, in the expectation that by so doing wages can be advanced. The trade is certainly better than it has been, but the price of coal at the pits has not at all advanced, so that to say the least the move is premature. Steam coal has gone off very well of late, especially for shipment for Hull, Grimsby, and Goole. A larger tonnage of engine fuel is being sent away, and the coke trade has never been more active. A great deal is forwarded to Lincolnshire to the furnaces there, as well as to Sheffield for the crucible steel furnaces.

CORNISH PUMPING-ENGINES.—The number of pumping-engines reported for July is 14. They have consumed 1280 tons of coal, and lifted 9·3 million tons of water 10 fms. high. The average duty of the whole is, therefore, 49,000,000 lbs. lifted 1 ft. high by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

	Millions
Dolcoath—85 in.	55·6
Mellanear—76 in.	50·6
West Tolgus—Richard's 70 in.	51·4
West Wheal Seton—Harvey's 85 in.	60·3
West Wheal Seton—Rule's 70 in.	57·7

WHOLESOME WATER SUPPLY.—There is a concensus of opinion that, wherever practicable, the system of storing water for dietetic purposes in domestic cisterns should be abolished. The absorption by the stagnant water of noxious gases, and the foul deposits which accumulate in the cisterns will cause the purest water to be, in a very short time, unfit for domestic purposes. In these days, when many householders devote considerable zeal to secure perfect sanitation in their homes, the necessity of a better and purer supply of water hardly meets with the amount of attention which might be expected. In many large towns, and partially in London, the system of a constant supply of water has been substituted for an intermitent supply, but difficulties have hitherto been experienced in obtaining suitable fittings. These difficulties are efficiently overcome by an ingenious high-pressure valve in combination with a compact apparatus, absolutely preventing the valve being carelessly or purposely left open, which has been patented by Mr. James Hitch, engineer, and is called the "Reliance" water valve and waste preventer. The valve and apparatus present great advantages, and particularly that where there is a constant supply, water can be supplied direct from the main for all domestic purposes, without the slightest chance of contaminating the water in the main, so that cisterns can be dispensed with. The valve may be constructed to withstand and to work easily under any or the highest pressure, without fear of loss by leakage.

FOREIGN MINING AND METALLURGY.

The condition of the French iron trade continues satisfactory. In the Haute-Marne coke made iron brings 8*l.* 8s. to 8*l.* 12s. per ton; mixed iron, 9*l.* 4s. to 9*l.* 8s. per ton; and plates, 10*l.* 8s. to 10*l.* 16s. per ton. In the Meurthe-et-Moselle producers of casting pig have advanced their rates 10d. per ton. Orders for Gilchrist-Thomas pig are becoming every day more numerous. The Micheville-Villerupt Company is about to devote one of its blast furnaces to the manufacture of pig of this description. There has been scarcely any change to report in the Nord; No. 2 iron has been quoted at 7*l.* 12s. to 7*l.* 16s. per ton. The Jules le Blanc Company has become proprietor of the Marquise establishments; merchants' iron has remained in active demand at Paris at 8*l.* per ton. The situation is considered satisfactory in the Ardennes. Annexed is a statement showing the manner in which the administration of the French State lines has allotted orders for 187,000 tons of steel rails, the delivery of which is required in 1883, 1884, and 1885. It will be remembered that tenders were invited for the supply of the rails in July and that only a limited number of the tenders sent in were accepted:—Terre Noire, 28,000 tons; Aciéries de la Marine, 18,000 tons; St. Etienne, 6000 tons; Firminy, 11,000 tons; Creusot (Usine de Jœuf), 31,000 tons; St. Nazaire, 18,000 tons; Denairs, 11,000 tons; Commentry (Beaucaire), 16,000 tons; Aciéries de France (Usine d'Aire), 22,000 tons; Fraissimont, 13,000 tons; and Longwy, 13,000 tons. The Eastern of France Railway Company has ordered 12,000 tons of rails from the John Cockerill Company. The same company has also ordered 6000 tons of rails from the Angleur works. The Northern of France has also sent a small order for *materiel* to the Sclessin works.

The Belgian iron trade has exhibited continued firmness. Numerous orders have come to hand, and the works are now employed for a very respectable time in advance. Pig especially has been in good demand. An important contract concluded by the Thy-le-Château Company with forgemasters in the French department of the Nord has absorbed a stock which imposed a certain dulness upon the markets. The contract in question embraces 10,000 tons of firm pig, but the parties have the option to carry the amount to 25,000 tons if they deem it advisable to do so. It will be seen that a great weight has been all at once removed from the markets, and quotations for pig have shown considerable firmness in consequence. The production of almost all the blast furnaces of the Charleroi district is now absorbed until the close of the year. English pig has maintained former rates upon the Belgian markets. No. 2 iron has made 5*l.* 16s. per ton, and No. 1 5*l.* 10s. to 5*l.* 12s. per ton. Plates have been extremely firm, especially in the Liége basin, where a quotation of 7*l.* 12s. per ton is generally adopted. Girders have been in request at 5*l.* 16s. 8d. per ton. The production of pig in Belgium in the first half of this year is returned at 360,000 tons, as compared with 305,000 tons in the first half of 1881. Iron was made to the extent of 254,000 tons in the first half of 1882, as compared with 229,000 tons in the first half of 1881. Steel in ingots was produced to the extent of 61,000 tons in the first half of 1882, as compared with 60,000 tons in the first half of 1881.

Coal has generally remained firm in Belgium. The good tone of the markets has become more decided, and it is not improbable that some advance in quotations will be established next month. The demand for coal is everywhere considerable in Belgium, the iron trade continuing to absorb larger quantities than usual, while the enquiry for domestic qualities is likely to present some improvement. Under these circumstances, coalowners show little inclination to conclude contracts, and are rather endeavouring, on the contrary, to form stocks, which they expect to be able to place upon profitable terms at a subsequent period. Labour is scarce, and colliery proprietors have already been obliged to advance wages in several districts. In the Mons district many working miners have left for the French departments of the Nord and the Pas-de-Calais. Quotations for coal have continued extremely firm upon the Belgian markets, but still it cannot be said that they have shown much change at present. Deliveries are being made with much activity. The production of coal in Belgium in the first half of this year is officially returned at 8,545,700 tons, as compared with 8,252,000 tons in the first half of 1881. The production has thus expanded this year to the extent of 293,700 tons. The condition of the German coal trade continues generally favourable. Deliveries of coal are very active over all the railways accommodating the basin of the Ruhr. The total exports of coal and coke from Germany in the first six months of this year were 4,744,000 tons.

MEXICAN AMALGAMATION PROCESS.

With a view to ascertain the chemistry of the Mexican amalgamation process, a series of interesting experiments was in 1879 undertaken by Prof. Huntington, of King's College, at the instigation of Dr. Percy, and in a paper recently read before the Society of Chemical Industry at Manchester he communicated the particulars of the main points of his investigation. He found that mercury worked up with sulphide of silver, chloride of sodium, sand and water, extracted about ¾ of the silver present, and three times as much as when chloride of sodium was absent. The presence of oxide of iron causes loss of mercury when the mixture contains chloride of sodium, owing to ferric chloride being formed, which is reduced to ferrous chloride by the mercury with formation of calomel. A very little oxide of iron has a very marked effect, as the ferrous chloride, as fast as formed, reoxidises, in contact with the air, to ferric chloride, and so on. When, in addition to the chloride of sodium, the mixture was made up with sulphate of copper, which would produce chloride of copper by double decomposition, rather less silver was obtained, and the loss of mercury was greater. However, on substituting the mineral proustite (silver 65·5, arsenic 15·1, sulphur 19·4) for the artificial sulphide of silver, twice as much silver was extracted by the mercury when the mixture contained chloride of copper. The decomposition of the sulphide of silver is very imperfect, unless the mixture be frequently and thoroughly agitated. Sulphide of zinc, in the presence of cupric chloride, causes the formation of sulphide of copper and chloride of zinc. It is well known that ores containing blende amalgamate badly. A number of experiments were made to establish the action of cupric and cuprous chlorides on sulphide of silver. The generally accepted explanation of the action of the chloride of copper in the Mexican amalgamation process is that one equivalent of argentic sulphide and two equivalents of cupric chloride becomes two of argentic chloride + one of cuprous chloride + one of free sulphur. Or that one of argentic sulphide + one of cuprous chloride becomes two of argentic chloride + cupric sulphide.

In the experiments made by Prof. Huntington it is shown that the liberation of the sulphur is entirely due to a secondary reaction which takes place only to a limited extent. One equivalent of argentic sulphide + one of cupric chloride becomes two of argentic chloride + one of cuprous sulphide in the primary reaction, whilst in the secondary reaction one of cuprous sulphide + one of cupric cholide becomes one of cuprous chloride + one of free sulphur. The secondary reaction takes place *pari passu* with the primary, at the moment double decomposition is occuring between the cupric chloride and the sulphide of silver, and is brought about by the copper of the chloride concerned in the reaction reducing to a lower chloride a further quantity of cupric chloride, in preference to combining with the sulphur of the sulphide of silver; so that in the result chloride of silver, cuprous chloride, and free sulphur are produced. The experiments, as a whole, lead to the conclusion that the amount of cuprous chloride formed and sulphur set free is directly dependent on (*a*) the strength and quantity of a solvent for cuprous chloride present, such as sodic chloride, (*b*) the temperature, (*c*) the presence of air. The secondary reaction is limited by the power of the solution to dissolve cuprous chloride. Obviously, if the cuprous chloride in solution can by any means be removed, the solvent power of the solution will be to a certain extent renovated. The action of

air in facilitating the secondary reaction is, therefore, due to its converting the cuprous chloride into insoluble oxychloride.

In the course of these experiments it was found that when sulphide of silver is treated with a strong solution of cupric chloride at a high temperature (boiling) in a stout closed bottle, cuprous chloride and free sulphur are formed in large quantities. If the heating be continued for some time all the free sulphur disappears, and sulphuric acid is formed. Under similar circumstances sulphide of copper strongly heated with cupric chloride, air being excluded, yielded sulphate of copper and cuprous chloride, no free sulphur being formed. Sulphur, strongly heated in a hermetically sealed tube with water, produced sulphuretted hydrogen, but no sulphuric acid. When a 300 per cent. solution of cupric chloride was similarly heated with sulphur, cuprous chloride and sulphate of copper were formed. The next point investigated was the action of cuprous chloride, dissolved in a solution of chloride of sodium, on sulphide of silver. This is a case of simple double decomposition—one of argentic sulphide, one of cuprous chloride, becoming two of argentic chloride, one of cupric sulphide.

A great many erroneous statements have been made by Malaguti and Durocher, and by others, as to the action of cuprous chloride on mixtures containing sulphide of silver. They say that silver is liberated in the metallic state. On this supposition they have built up various theories relating to amalgamation processes and to geological phenomena. These errors have arisen through their having employed ammonia as a re-agent in the investigation of the action of cuprous chloride on argentic sulphide. It was also found that "reversal" takes place when a mixture of chloride of silver and sulphide of copper is treated with water or chloride of sodium solution. No secondary re-action, liberating silver, however, takes place. It follows from the foregoing that, in order to bring about double decomposition between sulphide of silver and chloride of copper, the chloride of copper solution must be maintained at a certain strength, otherwise the re-action will cease, and anything which caused the solution to be still further diluted would undo a proportionate amount of the work already done.

PROVINCIAL STOCK AND SHARE MARKETS.

Cornish Mine Share Market.—Mr. J. H. Reynolds, stock and sharebroker, Redruth (Aug. 24), writes: With the exception of Killifreth and Wheal Uny business in other shares has not been of very great magnitude. At the former mine a dividend of 6s. per share was declared on Tuesday last, being more than double the previous one. Cook's Kitchen also in demand at higher prices. Subjoined are the closing prices:—Blue Hills, 1 to 1¼; Carn Brea, 11½ to 11¾; Cook's Kitchen, 39 to 39½; Dolcoath, 74½ to 75; East Pool, 55½ to 56; East Blue Hills, 10s. to 12s. 6d; Killifreth, 5¾ to 5½; Marke Valley, ½ to ¾; Mellanear, 4¾ to 5; New Cook's Kitchen, 6 to 6¼; New Kitty, 2½ to 3; North Busy, ¾ to 1; North Herodsfoot, 7s. 6d. to 10s.; North Penstruthal, ⅜ to ½; Pedn-an-drea, 3⅛ to 3⅜; Phœnix, 2¾ to 3; South Condurrow, 8¾ to 9¼; South Crofty, 12¼ to 12½; South Frances, 11¾ to 12; Tincroft, 11½ to 11¾; Tregembo, 3⅞ to 4⅛; West Basset, 10 to 10¼; West Frances, 10¼ to 10⅜; West Kitty, 14 to 14¼; West Peevor, 12½ to 12¾; West Polbreen, ⅞ to 1; West Poldice, 4 to 4¼; West Seton, 18 to 18½; West Tolgus, 14 to 15; Wheal Agar, 18 to 18½; Wheal Basset, 9⅛ to 9¾; Wheal Boys, 1 to 1⅛; Wheal Grenville, 10 to 10⅛; Wheal Hony and Trelawny, 2 to 2⅛; Wheal Jane, ⅝ to ⅞; Wheal Kitty, 1⅝ to 1⅞; Wheal Peevor, 7⅛ to 8; Wheal Prussia, ⅜ to ½; Wheal Uny, 5½ to 5⅝.

— Messrs. Abbott and Wickett, stock and share brokers, Redruth (Aug, 24), write:—Only a moderate business has been done in shares during the past week, and the tendency of the market is downward. Some of the progressive mines have received attention, but the dividend mines have been neglected. Dividend of 6s. at Killifreth. Subjoined are the closing quotations:—Blue Hills, 1 to 1¼; Carn Brea, 11 to 11½; Cook's Kitchen, 39 to 40; Dolcoath, 74¾ to 75; East Pool, 56 to 56¼; East Uny, ¾ to ⅞; Killifreth, 5¼ to 5½; New Cook's Kitchen, 6 to 6⅛; New Kitty, 2⅝ to 3; North Busy, ¾ to ⅞; Pedn-an-drea, 3¼ to 3⅜; Santa Gertrude, 170 to 175; South Condurrow, 9 to 9⅛; South Crofty, 12 to 12⅛; South Frances, 11 to 12; Tincroft, 11 to 11⅛; West Basset, 9¼ to 10; West Kitty, 13¾ to 14; West Poldice, 3¾ to 4⅛; West Peevor, 12⅛ to 13; West Frances, 10 to 10⅛; West Tolgus, 15 to 17; West Seton, 17¾ to 18; Wheal Agar, 18 to 18½; Wheal Basset, 9¼ to 9¾; Wheal Grenville, 10 to 10⅛; Wheal Jane, ⅛ to ¾; Wheal Kitty, 1½ to 2; Wheal Peevor, 7 to 8; Wheal Uny, 5¾ to 5½.

— Mr. S. J. Davey, mine sharedealer, Redruth (Aug. 17), writes:—Our market generally has been quiet this week, and business has been chiefly confined to Killifreth, Wheal Uny, East Pool, South Crofty, Dolcoath, Cook's Kitchen, and Wheal Agar. East Pools have fallen ¾ on the week. Dolcoaths advanced 1½, South Croftys 1, Wheal Uny ¼, and Pedn-an-drea ⅛. At Killifreth meeting on Tuesday a dividend of 6s. per share was declared. To-day there is not much doing except in Killifreth and Pedn-an-drea. Subjoined are the closing quotations:—Blue Hills, 1¾ to 1⅞; Carn Brea, 11 to 11½; Cook's Kitchen, 39½ to 40: Dolcoath, 74¾ to 75; East Bluo Hills, ⅛ to ⅜; East Lovell, 1¾ to 1¾: East Pool, 55¾ to 56¾; Killifreth, 5l. 10s. to 5l. 12s. 6d.; Mellanear, 4¾ to 5; New Cook's Kitchen, 6 to 6½; New Kitty, 2½ to 3; North Busy, ¾ to 1; Phœnix, 2⅝ to 2⅞; Pedn-an-drea, 3¾ to 4; South Condurrow, 9 to 9⅛; South Crofty, 12¼ to 12½; South Tolcarne, 3 to 3⅛; South Wheal Frances, 11¾ to 12; Tincroft, 11 to 11½; West Basset, 9¾ to 10; West Frances, 10 to 10⅛; West Kitty, 13⅜ to 14⅛; West Peevor, 12⅝ to 13; West Poldice, 4 to 4⅛; West Tolgus, 15 to 20; West Wheal Seton, 17¾ to 18¾; Wheal Agar, 18¾ to 18½; Wheal Basset, 9⅜ to 9⅝; Wheal Comford, 1¼ to 1½; Wheal Grenville, 10¾ to 10¾; Wheal Peevor, 7⅛ to 8; Wheal Kitty (St. Agnes), 1¾ to 1⅞; Wheal Uny, 5¾ to 5¾; East Uny, ⅞ to 1.

— Mr. M. W. Bawden, Liskeard (Aug. 24), writes:—The mining market presents a steady appearance, with but little fluctuation in prices. Killifreth, Phœnix United, South Crofty, Wheal Kitty, and Wheal Uny find buyers at quotations. Subjoined are the closing quotations:—Bedford United, 2¾ to 2¾; Carn Brea, 11 to 11¾; Cook's Kitchen, 39½ to 40; Dolcoath, 74⅝ to 75; Devon Consols, 5⅛ to 5¾; East Caradon, ⅝ to ¾; East Pool, 56¼ to 57; Gawton United, ¾ to ⅞; Glasgow Caradon, ¾ to ⅞; Gunnislake (Clitters), 3 to 3¼; Herodsfoot, 2s. 6d. to 5s.; Hingston Down, ½ to ⅝; Killifreth, 5¼ to 5½; Marke Valley, ¼ to ⅜; New West Caradon, ½ to ¾; North Herodsfoot, ⅛ to ¼; Old Gunnislake, ⅛ to ¼; Phœnix United, 2⅞ to 3; Prince of Wales, ¼ to ⅜; South Caradon, 12½ to 15; South Condurrow, 8¾ to 9; South Crofty, 13 to 13⅛; South Devon United, ¾ to ⅞; South Frances, 11½ to 11¾; Tincroft, 11 to 11¼; West Basset, 9¾ to 10; West Caradon, ½ to ¾; West Frances, 10 to 10¼; West Mary Ann, 1 to 1¼; West Peevor, 12 to 12¼; West Phœnix, ¼ to ⅜; West Seton, 17½ to 18; Wheal Agar, 17½ to 18; Wheal Basset, 9¼ to 9½; Wheal Crebor, 2½ to 2¾; Wheal Grenville, 10¾ to 10⅛; Wheal Hony and Trelawny, 2½ to 2¾; Wheal Kitty, 1⅞ to 2; Wheal Jane, ⅝ to ¾; Wheal Peevor, 7¼ to 7⅝; Wheal Uny, 5¾ to 6.

Manchester.—Messrs. Joseph R. and W. P. Baines, share brokers, Queen's Chambers, Market-street (Aug. 24), write:—The past week has been a quiet one, producing comparatively few transactions and few incidents of importance. Up to Monday last Egyptian stocks showed sharp advances daily, the Unified going on that day as high as 62¼, since then they have been quieter and have fluctuated since, but to-day mark within a fraction of best points. Latterly there has appeared a disposition to take profit on Unified and buy Preference, which has caused a pause in the advance of the former. During the greater portion of the week the weather has been very unpropitious, and this has had, together with some apprehension of a further advance in the Bank rate, a depressing effect on most of the leading securities. The general market is quiet, but the tone is steady; the majority of alterations in prices are favourable. The general feeling in the market is one of expectation, operators being desirous of seeing the result of the rapid development of the campaign in Egypt. The expectant attitude has no element of distrust in the ultimate issue, but for the present the public are waiting for the accomplishment of their hopes before operating largely.

Banks.—The transactions herein are not numerous, but are spread about amongst most of the local concerns, and the aggregate bears a fair proportion to the sum of the dealings of the week. Full late rates have in most cases been realised, and quotations where altered show favourable change, there being no instance of decline.—Higher: Manchester and Liverpool District, ¼; Manchester and County, ¼; and Consolidated, 1/16.

Insurance.—This class of investment continues very neglected, but figures show no important changes. The business done is very meagre, being confined to a few scattered lots. Higher: British Re-Insurance, ⅛; Boiler Insurance and Steampower, ⅛; and English and Scottish Boiler, 1/16. Lower: Positive Assurance, 3d.

Coal, Iron, &c., and Mining.—Though the business doing herein is very restricted the tone, as evidenced by movements in prices, is certainly better. Ebbws have been very slow, but figures are unaltered. In Bolckows few lots have changed hands, but figures have been moving upward steadily in anticipation of dividend announcement, and mark a decided rise on the week in both fully paid and 12l. paid issues. Dividend declared to-day at sale of 7½ per cent. same as last year. Canadian Copper, &c., are easier, with sluggish market. Palmer's Shipbuilding are irregular, the A's being lower, whilst the B's show a rise. A. Knowles and Sons' coal are better; margin of quotations is narrowed, for whilst buyers' quotations has gone up ¼, sellers' figure is only put up ⅛. The publication of the Llynvi and Tondu Company's balance-sheet has caused a brisk demand for the 7 per cent. preference shares, and sellers being scarce, a rise of ¼ in this issue is established, but the ordinary shares do not as yet quote any advance. Higher: Pelsall Coal, &c., 1; Bolckows, fully paid, 1¼; ditto, 12l. paid, ½; West Cumberland, ¼; Palmer's Shipbuilding, B, ⅜; Nant-y-Glo and Blaina, pref., 1; Tees-side Iron and Engine, ¼; Bilbao Iron Ore, ¼; and A. Knowles and Sons, ¼. Lower: Park Gate Iron, 1; Palmer's, A, ⅞; Indian Phœnix Gold, ⅛; and Canadian Copper, &c. 9d.

Cotton, Spinning, and Manufacturing.—This market keeps firm with fair enquiry and some advanced prices, but not much business is in progress, the slightest approach to demand making sellers very hard to deal with.

Telegraphs.—Very little doing in Anglo ordinary, and A's are a shade better; rest unaltered.

Telephones.—Moderate business in Lancashire and Cheshires at slightly better rates, advance on the week being about 2s. United are ¼ higher, and Orientals 1/16 lower.——Corporation Stocks, &c., steady, but quiet.——Canals unchanged.——Miscellaneous exhibit no movements worthy of special notice. Bradbury and Co., sewing machine makers, declare an interim dividend at the rate of 10 per cent. with a handsome sum carried forward.

Railways have had a dull market most part of the week and figures on the whole are easier, but not distinctly so. Brighton A's are exceptional, and mark a substantial advance. Sheffield A's and North British are foremost in the declines, the latter more particularly, the fall in them having occurred today on the announcement of a 2½ per cent. dividend with 3000l. over. They close at about lowest touched. Canadians easier. The Trunk traffic, for eight days, against seven days in corresponding week, is 9570l. increase. Chicago and Grand Trunk 642l. increase. Americans have varied slightly, and on the week are rather lower.

Newcastle-on-Tyne Stock Exchange.—Mr. Faraday Spence, stock and share broker, Grey-street (Aug. 24) writes: Business during the past week has been limited. Barrow Hematite Steel ordinary shares, 11⅞ to 12; and pref., 10⅝ to 10¾. Bede Metal and Chemical are in demand at 20, whilst I think a seller could be found at a shade above that figure. Bolckow, Vaughan, and Co.'s 20l. paid shares are 26½ to 27; 12l. paid shares, 15¼ to 15½; and pref., 20⅞ to 21⅛. Consett Iron shares are a little easier this week, and close 24 to 24¼, ex div. Consett Spanish Ore shares continue in good demand at 37s. ex div., no sellers. Darlington Steel and Iron shares remain flat at about 3. John Abbott and Co.'s shares are offered at 45, whilst 40 is best bid. Orconera Iron Ore 7 per cent. preference shares are 5⅜ to 5 7/16. Palmer's Shipbuilding and Iron Company's A shares are quiet at 25 to 25¼. The B shares have improved during the week, and close 16¾ to 17. Skerne Iron shares are very flat at 1¾ to 2. Tees-side Iron and Engine Works ordinary shares are 1½ to 1⅝; and preference 1⅞ to 2.

Tharsis Sulphur and Copper, 10l. paid shares are 40⅞ to 41; and 7l. paid 31¼ to 31⅛. Tyne Forge shares are 14⅜ to 14½. West Cumberland Iron and Steel shares have improved to 13¾ to 14. Cashwell Lead Mine shares are offered at 10s. each, whilst there is a probable buyer at 2s. 6d. Crookburn Mine shares are quite nominal at 1s. to 1s. 6d. Green Hurth Mine shares are wanted at 7½; no positive seller at moment. Hexham and Edmundbyers Mine shares are wanted at 16s.; seller asks 17s. 6d. North Green Hurth Mine 1l. paid shares are 18s. 6d. to 19s.; and 4s. 6d. paid shares 5s. to 6s. Pattersyke and Clargill Mine shares are 7s. 6d. to 8s. 6s.

SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

Stirling.—Mr. J. Grant Maclean, sharebroker and ironbroker, (Aug. 24), writes:—During the past week the markets have been quiet, owing to holiday influences, unsettled weather, and the improved tendency of the money market. Prices, however, have a favourable tendency, influenced by the favourable news from the seat of war, and there is every chance business will take an upward turn, provided the harvest turns out well, as the export trade is now on a larger scale than ever before.

In shares of coal, iron, and steel companies the principal movement has been an advance on Steel Company of Scotland shares from 6½ to 8½; owing to a dividend being recommended of 7 per cent., which compared with 5¾ per cent. last year. In 1880 they paid 9 per cent., and in 1879, 6 per cent. Llynvi and Tondu preference shares are better at 70s. to 80s.; at this company's meeting to-morrow a dividend of 7 per cent. is to be recommended on these shares. The Cardiff and Swansea has a loss of 4196l. on last year, increasing their debit balance to 35,843l. Clyde coal shares have advanced from 25s. to 31s., on rumoured sale of a portion of their property to a company. In the Scotch pig-iron market the price of warrants has been steady from 49s. 9d. to 50s. 6d. The reports of this trade are satisfactory from all quarters, but the dearer money market and rumours regarding the agreement for restricted production between the Cleveland and Scotch makers, which expires next month, have unsettled the market. It is understood the Cleveland makers are inclined to renew the agreement for six months, and the Scotch makers held a meeting yesterday, but adjourned to next Wednesday owing to the want of attendance of a principal member, although it was said the feeling was generally favourable to renewing the agreement.

In shares of foreign copper concerns prices do not show much alteration. Tharsis advanced from 40¾ to 41l. 11s. 3d., on a statement that the 7l. shareholders would probably abandon their action. Huntingtons have advanced from 22s. 6d. to 24s.; Mason and Barry, 16¾ to 16½; Panulcillo, 6½ to 6¾; Santa Cruz, 1s. 3d. to 2s. 6d.; and Vicaya Santanda, 10¾.

In shares of home mines business continues quiet. Glasgow Caradon shares remain at 15s. 6d.; the sale of this company last Thursday of 160 tons realised 861l. 4s. 6d., or an average of 5l. 7s. 7d. per ton. In June 140 tons were sold at an average of 120s. 6d., while in July, 1881, the sale was 200 tons, at 66s. 11d. In the month of August in previous years the sales ranged from 150 to 250 tons, and the prices realised from 84s. 2d. to 118s. 1d. This company seems to be doing better now; as compared with last year, it has realised about 723l. more for an equal quantity of ore sold. Anderton Tin shares firm; the mine will make another sale of tin about the first week of September. A meeting is expected to be held at the end of that month, when a balance will be shown with a cash credit, after paying all liabilities. At the present price of tin their sale will probably realise a profit of 30 per cent., and the future is in every way satisfactory, as the lode continues as rich as ever. Bedford United are at 45s.; Bell Vean, 10s.; Bwlch United 15s. to 20s.; British Silver-Lead, 20s.; Caron, 2s.; Drakewalls, 5s. to 10s.; East Wheal Rose, 7s. 6d. to 12s. 6d.; East Blue Hills, 10s.; East Botallack, 15s. to 20s.; Great Wheal Worthy, 10s.; Indian Queens, 2s. 6d. to 5s.; Langford, 5s. to 10s.; Mounts Bay, 5s. to 7s. 6d.; New Terras, 42s. 6d.; Old Owlacombe, 9d.; Old Shepherds, 4s. to 6s.; Pandora 2s. 6d. to 5s.; Parkas, 2s. 6d. to 5s.; St. Just United, 10s. to 12; Tamar, 5s. to 7s. 6d.; Treavean, 5s. to 7s. 6d.; Tankerville, 4s. to 6s.; West Crebor, 9s. to 10s.; Wheal Fortune, 7s. 6d. to 12s. 6d.; Wheal George, 10s. to 20s.; and Wheal Owles, 6 to 8.

In shares of gold and silver mines the principal feature has been a decline in Richmonds from 11l. to 9l., but Indian descriptions are firm. Akankoos are at 7s. 6d.; Cedar Creek, 2s. 6d. to 5s.; Gold Coast, 17s. 6d. to 22s. 6d.; Guinea Coast, par; Indian Consolidated, 11s. 3d. to 13s. 9d.; Indian Kingstons, 4s. to 6s.; Indian Trevelyan, 11s. 3d. to 13s. 9d.; Kapangas, 15s. to 17s. 6d.; Kohinoor and Donaldson, 20s. to 25s.; New Gold Run, 4s. 6d.; ditto (pref.), 7s. 6d.; Nouveau Monde, 5s. to 7s.; Organos, 70s. to 80s.; Quartz Hill, 1s. 3d. to 2s. 9d.; Rhodes Reef, 11s. 3d. to 13s. 9d.; Rio Grande do Sul, B, 12s. 6d. to 15s.; Simons Reef, 6d.

In shares of oil and miscellaneous companies there is no particular alteration to notice. Lawes' Chemicals remain 5¾ to 6¼.

Edinburgh.—Messrs. Thomas Miller and Sons, stock and share brokers, Princes-street (Aug. 23), write:—The market has been quiet, and the changes in prices are unimportant. North British has receded from 95 to 94½. Caledonian Preference, No. 1, has risen from 105½ to 106; North British Preference, No. 1, from 105⅜ to 105¾; ditto, 1865, Five per Cent. Preference from 118 to 120¼. North British Four and a Quarter per Cent. Debenture Stock has declined from 111 to 110½. Canadians have become weak. Grand Trunk Ordinary has declined from 21 13/16 to 21¼; the Third Preference 47 to 46. In Americans New York, Pennsylvania, and Ohio First Bonds have declined from 48¾ to 47⅝; Erics from 41⅛ to 40; Ohio and Mississippi from 39¼ to 38⅝. British Linen Bank Stock has risen from 298 to 300. Clydesdale has fallen from 23¾ to 23. Northern Assurance Shares are 1s. 3d. lower, at 49½. National Guaranteed are 2s. 6d. higher, at 80s. Clyde Coal shares have risen from 25s. to 31s.; Omoa and Cleland from 16s. to 18s.; Steel Company from 6½ to 7½; Tharsis from 40 15/16 to 41¼. Broxburn Oil have declined from 27½ to 27¼; Prairie Cattle from 15⅜ to 15.

IRISH MINING AND MISCELLANEOUS COMPANIES SHARE MARKET.

Cork.—Messrs. J. H. Carroll and Sons, stock and share brokers, South Mall (Aug. 23) write:—Markets remain steady. Great Southerns changed hands at 116½ to 116¾; and Midland at 85¾. Bandons unchanged. National Banks were done at 23¾ and 24, and Munsters at 7 to 7 1-16th. Hibernians also changed hands at 36. No change in Provincials. Cork Steam Packets continue sn demand at 11, and Lyons shares at 5½. Gresham Hotels were done at 3l. 11s., and Breweries asked for at 5½.

FRENCH AND D'ESTERRE DIAMOND MINING COMPANY.

The report of the directors for the half-year ended June 30 states that although this is the third half-year since the formation of the company it is only from the commencement of this half-year that there has really been a chance of working remuneratively. The principal reason of this was the delay in obtaining the depositing site so absolutely necessary for the working of the blue ground. At the close of the last half-year the directors thought that the troubles of the company were at an end, new washing machinery had been erected, and there was a fair supply of blue ground ready for washing. Soon after this machinery commenced to work it was found that the boiler of the engine supplied by the contractors was faulty, and the working of the patent chain connected with the elevators gave constant trouble, delay, and consequent loss. It was at one time feared that they might have to take action against the contractors, but an amicable arrangement was come to, they making certain alterations in the machinery, and supplying us with a very fine 16-horse power engine and boiler at a small additional cost, in lieu of the defective 10-horse power engine and boiler condemned. Owing to the above-mentioned delays the company made no profit during the months of January and February, and the over-draft against the general working expenses of the company stood at over 6000l. Since then it will be seen the above over-draft has been paid off, and the company have now to the credit of profit and loss account 2093l. 2s. 4d.

The requirements of the company for machinery were in the first instance underrated. The money put aside for new machinery—10,000l.—has been expended. In addition to that sum the directors consider about 6000l. will meet the cost of new machinery erected, and in the course of erection. This consists of a complete and very powerful hauling gear, pulsator, new 12-ft. washing machine, and other improvements; also a considerable amount of well sinking. The addition to the washing machinery will enable them to wash a larger amount of ground. The new hauling gear can, if desired, be used for the 14 claims adjoining the reef, and a neighbouring company having kindly promised to allow them the use of a portion of ground on which to lay their rails, they will be able to work with it the block of 25 claims. All expenses for alterations, repairs, and up-keep of machinery, as well as the unskilled labour employed in erecting the new machinery, having been charged to general expenses and wages accounts, the directors have not written off anything for depreciation. That in use is in thorough working order and good repair. It is expected the new hauling gear will start working about the end of July. The block of four claims has been leased for a term of six months from April 6 at a rental of 80l. per month. The company ends the half-year with nearly the same amount of blue ground on the floor as there was at the commencement. Experience has shown how undesirable it is to work unprepared ground, and that with no amount of breaking up and watering will the ground yield the same as if left to be thoroughly disintegrated by the action of the atmosphere and rain. They hope if there be no falling off in the labour supply by the end of the coming half-year to have such a reserve of ground on the floor as to prevent their having again recourse to artificial means of breaking up.

TAMBRACHERRY ESTATES AND WYNAAD GOLD MINING COMPANY.

The report of the directors prepared for presentation at the meeting on Aug. 28 states that the past year's coffee crop proved larger than was estimated, and amounted in all to 207 tons 2 cwts. 1 qr., which, at the average prices of the preceding three years, would alone have sufficed to pay a fair dividend on the capital of the company. The first shipment sold well, but the unfortunate collapse of the market in May and June completely upset all calculations; and the directors decided to withdraw from sale a considerable portion of the subsequent shipments in the hope that later in the year better prices may be obtained. The market already shows signs of improvement. The net profit on the crop shown in the balance-sheet may be taken as fully 2000l. below the expectations of the directors; but it may be assumed that, under ordinary circumstances, a crop of coffee alone of about 200 tons, will suffice to yield a profit of 5 per cent. on the present block cost of the company. A small shipment of Succirubra bark from the first experimental planting has recently arrived, and the result will form a guide as to the value of this portion of the company's property, from which, after the next two years, the directors anticipate a considerable revenue. Up to the end of the present season, about 500,000 plants in all will have been put out, and nurseries formed for about 200,000 more, to supply failures and extend the acreage next year. The recent plantings include a good proportion of the more valuable varieties, *C. ledgeriana* and *C. verdi*, as well as the useful hybrid *C. robusta*, for which the soil and climate of Wynaad prove well adapted.

With regard to gold mining the report states that shareholders have already been advised that looking to the large stake this company holds in the Cootacovil Gold Mining Company, the directors considered it of the utmost importance to concentrate their efforts on the work of the latter company; in order to get all machinery up to the mine, and safely housed, and all mine openings made as secure as possible before the monsoon. It is very fortunate this course was adopted, inasmuch as the monsoon has been the severest known for many years, and notwithstanding all precautions, some damage occurred through landslips, which, however, will not take long to repair. The season, too, has been unusually sickly, and so much fever has prevailed among the mining staff, that but for the assistance rendered, the Cootacovil work must have been much delayed. The machinery of that company is now rapidly approaching completion, and is expected to commence steady working some time before the end of the year. The directors believe prudent economy to be a main element in the future success of gold mining in India.

A considerable amount in a wrong direction was done to find the Cootacova reef, and Mr. Harvey now recommends them to await its further development on Cootacovil ground before endeavouring to trace it in Tambracherry. Cattle Pen reef will be sought for on higher ground, Guinea Grass reef will also now receive attention. The reef discovered on the Chundale estate is now being sunk on to a depth of 80 or 90, or until water is reached, when if it proves to be a strong reef the estate may be advantageously sold. An area of alluvial deposits extending over about 13 acres along the river side was discovered on the Charlotte Estate, and by Mr. Harvey's direction, trial holes were sunk in different parts, which resulted in every case in a fair show of gold, mixed with decomposed pyrites in the shape of heavy black sand. On receiving a sample, the directors immediately telegraphed instructions to wash 10 tons of soil, and ship the residue intact for treatment in England, but the advent of the monsoon necessitated the work being hastily done in a roughly extemporised cradle, and the superintendent reports some of the gold to have been unavoidably lost. As soon as weather permits a fresh lot will be carefully taken, meantime the first lot on its arrival will afford some guide as to its value and best mode of treatment. This ground can be worked at comparatively small cost, but little machinery being required.

The balance to credit of profit and loss account, 6250l. 1s. 10d., the directors propose shall be appropriated to the payment of a further dividend of 2½ per cent., free of income-tax, making the total distribution 12½ per cent. for the year. They further propose to write off 1763l. 5s. 4d., on account of preliminary expenses, and to carry forward the balance, 486l. 16s. 6d., to next year's account.

Gold Mining in the Transvaal.—It is stated that the owners of the Spitzkop Farm—Messrs. Otto Rothschild, of Hatton Garden, and Guilbaud and Franck, of Tours—have received information by the last mail that the Transvaal Government have granted them a concession of the gold deposits on their farm, which is 6000 acres in extent, and that private diggings have therefore been entirely stopped. It is added that almost every mail from the Cape brings them newspapers mentioning the Spitzkop property in glowing terms, and the Kimberley Correspondent of the *Mining Journal* has also from time to time given a good account of it. The owners naturally congratulate themselves on the value of their property, and are now seeking to dispose of it to European capitalists. The Diamond News of May 6, after giving an account of what a recently issued Parliamentary Blue Book says about the riches of the Lydenburg gold fields, observes—this it must be borne in mind was before the discovery of the fine gold in the rotten reefs, which has caused something like a revolution in the prospects of these fields. The Natal Mercantile Advertiser (May 27) says: During the week we have seen some splendid specimens of Spitzkop gold in the possession of a gentleman who has just come from there, and by whom we are informed that the prospects of the location, as far as the outturn of gold is concerned, are bright indeed; this, however, is no encouragement to the individual digger, who is not now allowed to take out claims, as it has been closed against the public. The same newspaper (June 12) says that Messrs. Silo and Tait have unearthed high up on the terrace above the homestead at Spitzkop as rich a rotten reef as, if not richer than, any yet discovered. The yield is remarkable; out of a dish of the decayed conglomerate, taken indiscriminately from the face and panned off, as much gold can be got as could be piled on a sixpenny piece; it is really astonishing to see the yield of gold from this thick vein of decayed quartz. The Natal Witness (July 4) says Spitzkop has now been bought by a company, who are here at Lydenburg represented by Mr. Franck, who intends leaving for Europe next week, and from the specimens I have seen of gold-bearing quartz from the farm I have no doubt he will be able to do well. The reef is wonderfully rich, and ought to bring a fortune to the proprietors. The Kimberley Daily Intelligencer (July 13) writes: Against many and great disadvantages the gold fields have gradually developed, more especially within the last two years, during which time great attention and labour have been turned to reefing, which has resulted in the discovery of valuable property, commencing with the fine gold up at Waterfall, Spitzkop, &c. Other equally favourable views being expressed in South Africa the owners of the property are sanguine that they will be able to raise the capital they ask for either in London or Paris.

Manufacture of Mineral White.—A simple and economical method of making mineral white for giving body to or coating paper, or for mixing with asbestos, or other refractory material for making fireproof goods, has been invented by Mr. T. H. Cobley, of Dunstable. For this purpose he decomposes sulphate of magnesia, which may be native sulphate or kieserite, by means of hydrate of lime, causing a reaction by which is produced a precipitate or magnesia mixed with sulphate of lime. Or otherwise he precipitates sulphate of lime from a solution of chloride of calcium treated with a solution of sulphate of magnesia, thus recovering chloride of magnesium in solution, which treated with hydrate of lime gives a precipitate of hydrate of magnesia and a solution of chloride of calcium, the latter solutions being available for fresh treatment with sulphate of magnesia. When chemical impurities, such as compounds of iron, exist in the solution, he precipitates them in the first place, and mechanical impurities he removes by filtration. The precipitates may be separated by filtration or decantation, or by means of a filter press. The sulphate of magnesia precipitate is improved by the addition of a small percentage of sulphuric acid, or alum, or of both. The hydrate of magnesia precipitate mixed with alumina is particularly applicable as a paste for cotton fabrics not susceptible of mildew, or to mix with paper pulp, or to give paper a surface to receive colour printing. The sulphate of lime precipitate is also applicable with great advantage for mixing with paper pulp. In all cases he prefers to use saturated solutions, and when treating the magnesian solutions to apply heat. The precipitates before use should be washed and pressed, and when they have an acid reaction the acid should be removed by hot water or steam.

Messrs. Thurgood and Co., estate agents, surveyors, and auctioneers, of Chancery-lane, have taken into partnership Mr. Howard Martin (late of Podmore and Martin, Croydon), and the style of the new firm will be Thurgood and Martin.

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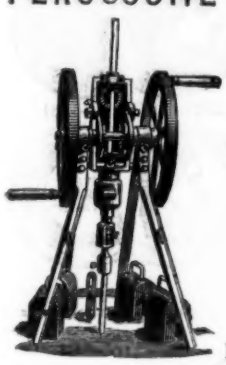

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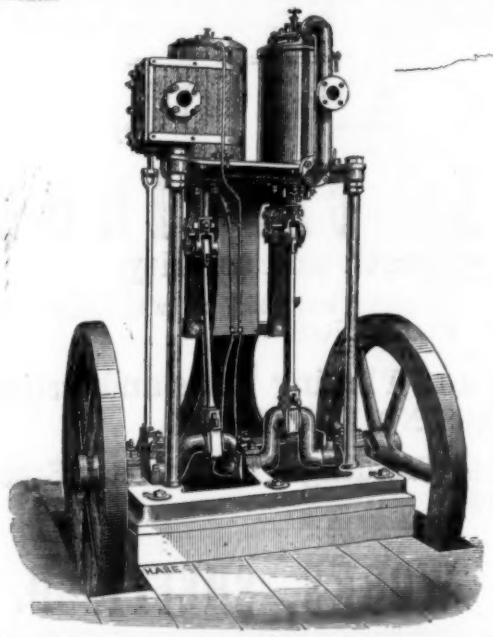

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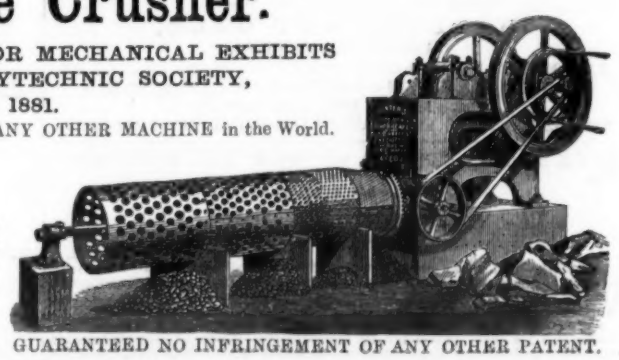

GUARANTEED NO INFRINGEMENT OF ANY OTHER PATENT.

These Machines turn out the same amount of work with less than half the power, and make a better sample of Road Metal, with 50 per cent. less waste than any other machinery, and for Crushing Purposes they are still more advantageous, as the sudden action entirely dispenses with the clogging when used for crushing softer materials, and thereby saves many breakages and a great waste of power. There is also a saving of fully 75 per cent. of lubrication required over the Blake Machine, and as a proof of this, our driving shaft never becomes heated. We are also prepared to guarantee our driving shaft from breakage in any of our Knapping Motion Stone Breakers.

We have already supplied our Machines to Derby, Harrogate, and Falmouth Local Authorities; besides several Quarry Owners, Contractors, Plaster Manufacturers, Mining Companies, &c.

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SAFE
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APPLICABLE TO ALL KINDS OF BOILERS & FURNACES
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THE
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New Patent Brick-making Machine,

Embraces the following advantages—viz.:

Simplicity, strength, and durability. Compactness and excellence of mechanical arrangements, large producing capabilities, moderate cost.

It makes two bricks at once, and will make 2,000 to 14,000 plastic pressed bricks per day, hard enough to go direct to the kiln without drying; or it will make the bricks thoroughly plastic if required. For works requiring a machine at less cost the machine is made to turn out one brick at once, and is capable of producing 8000 bricks per day.

The Machine can be seen at work daily at the Brickworks of the Patentees, JOSEPH FIRTH AND SONS, WEBSTER HILL, DEWSBURY, and CROWBURY BRICK WORKS, SUSSEX; as also their Patent Gas Kiln for Burning Bricks, which possesses the following amongst other advantages, viz.:—Economy in Fuel, Rapidity and Quality of Work, even Distribution of Heat, and Total Consumption of Smoke.

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Queen's Crescent, Haverstock Hill,
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DEAR SIR,—Some time since, being greatly fatigued with overwork and long hours at business, my health (being naturally delicate) became very indifferent. I lost all energy, strength, and appetite, and was so weak as to be scarcely able to walk.

As you are aware, I sent for a dozen of your Extract of Meat and Malt Wine, which, in a few days, pulled me up marvellously. Three or four glasses of it daily have quite altered and restored me to better health than ever, "without the assistance of a doctor."

I am now giving it to my son, twelve years of age, whom we have always thought consumptive, and from a puny ailing boy he seems to be fast growing into a strong healthy lad.

Enclosed you have cheque. Please send me two dozen of the "Extract." With thanks for your prompt attention to my last

I am Sir, yours truly,
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STEAM ENGINES, Portable and Fixed
(For Coals, Wood, Straw, and every description of Fuel.)

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Special Polishing Machinery and Materials.

SPECIAL ELECTRO-DEPOSITING SOLUTIONS

For depositing **Copper in any thickness upon** rough castings or polished **Iron** objects of any size or weight, Locomotive Boiler Tubes, Iron Railings, Ornamental Lamp Posts, Garden Seats, Iron Sheets, and parts of heavy Iron Structures.

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For depositing **Tin** upon Bright Steel Goods, or **upon** rough Iron. **The insides of Iron** or **Copper Pans,** Kettles, and Culinary Utensils (Chemically pure).

For depositing **Copper** reproductions of **Art Subjects, Stove and Door Panels,** Plates, Medallions, &c., from Plaster, Wax, or other Moulds.
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For ELECTRIC LIGHTING (Arc and Incandescence) for Public Streets and Gardens, large Open Spaces, Theatres, Factories, Workshops, Hotels, Houses, &c.

ENTIRE SYSTEM COMPLETE, EFFICIENT, AND INEXPENSIVE.

Special Apparatus for the application of Ozone and other Gases for Bleaching Oils, Sugars, Fabrics, &c.

Complete Outfits. **The "Elmore" Machines and appliance for** TIN-PLATE MANUFACTURE.

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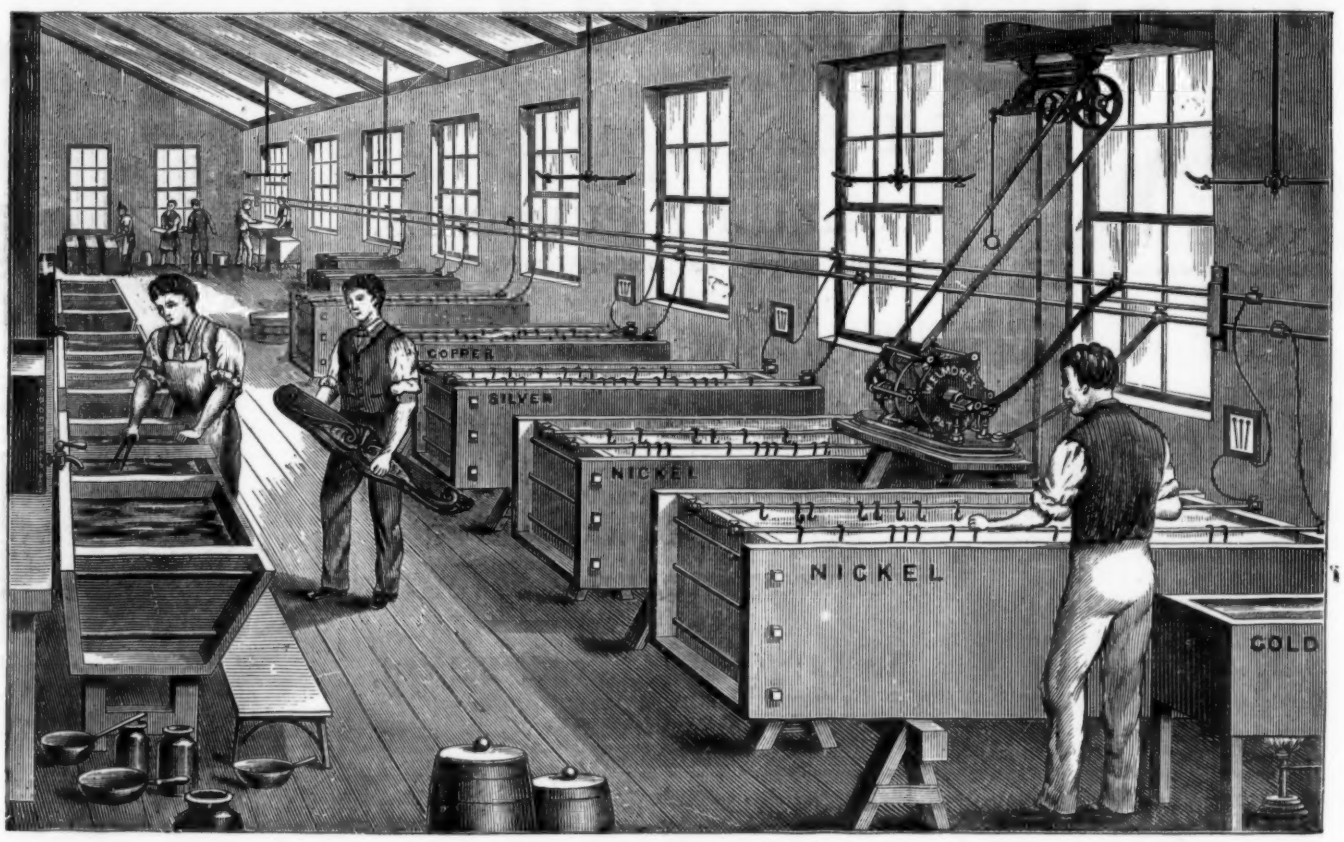

The above represents an Electro-Plating Works in which an "ELMORE" PATENT DYNAMO-ELECTRIC MACHINE is being used for the simultaneous deposition of Nickel, Silver, Copper, Bronze, Brass, Gold, Tin, Zinc, &c., from their Solutions.

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TESTIMONIALS, &c.

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From the "LONDON MINING JOURNAL."

"The new 'Elmore' Dynamo-Electric Machine can be seen in operation in London, and is considered one of the most wonderful scientific apparatus which has yet been brought before the public; it should be inspected by all who are interested in any kind of metallurgical operations."

"Mr. ELMORE has just received two pieces of ordnance from Her Majesty's Works at Chatham, with an order to nickel-plate the same, together with the carriages upon which they are mounted. Mr. Elmore has done similar work for the Government on previous occasions, and it will be remembered that the screw propellers used on the torpedo boats were nickel-plated by him. The 'Elmore' Dynamo-Electric Machines and complete electro-plating outfits have been supplied to Government Departments at home and abroad."

From the NICKEL PLATING COMPANY,
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". . . . . Your Machine does *its work most satisfactorily, and has never once reversed current,* which the Weston Machine frequently did." . . . . .

From the ELECTROLYTIC COMPANY,
ART METAL DEPOSITING WORKS,
CHARLOTTE STREET, BLACKFRIARS, LONDON.

"The *'Elmore' Dynamo-Electric Machine* and entire outfit which you have supplied to this company have given perfect satisfaction." . . . . .

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"Having had one of the *'Elmore' Patent Dynamo-Electric Machines* in constant use for several months, it gives me great pleasure to say that with it I have been able to deposit four times the weight of metal per day which I had been enabled to do with the Dynamo-Electric Machine, which it has displaced in my establishment."

From the LONDON NICKEL PLATING COMPANY.

"We have much pleasure in expressing our entire satisfaction with the nickel-plating solution, anodes, and Dynamo Machine that you have supplied us with.

From the DYNAMO-ELECTRIC PLATING WORKS.
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"The quality of the nickel solutions and anodes at these works, which were supplied by you, is most satisfactory in every way. . . . . The Dynamo Machine also works excellently, and has given no trouble whatever since it has been started."

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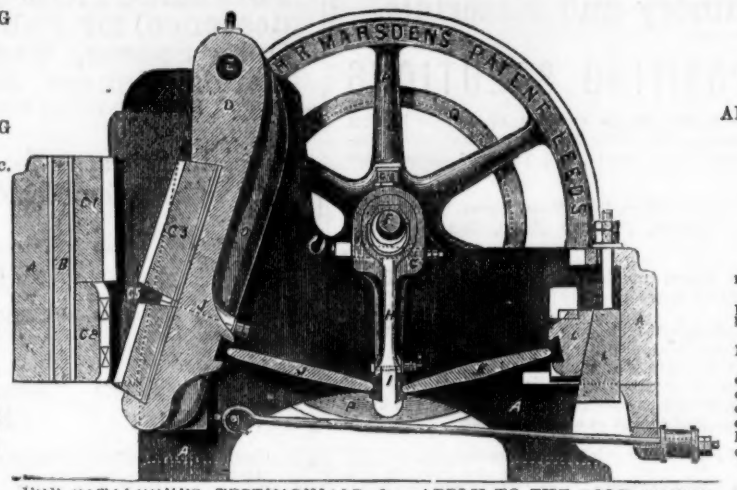

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"The 15 × 8 stonebreaker gives perfect satisfaction. It produces a more cubical stone than any others I have seen at work."

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"Your 10 × 7 crusher at the Aruba Gold Mines will crush 90 to 100 tons per 24 hours of the hardest gold quartz to 1 'size.'"

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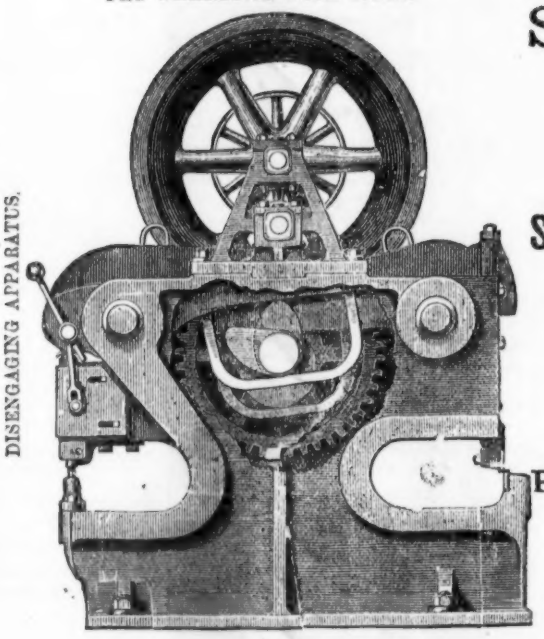

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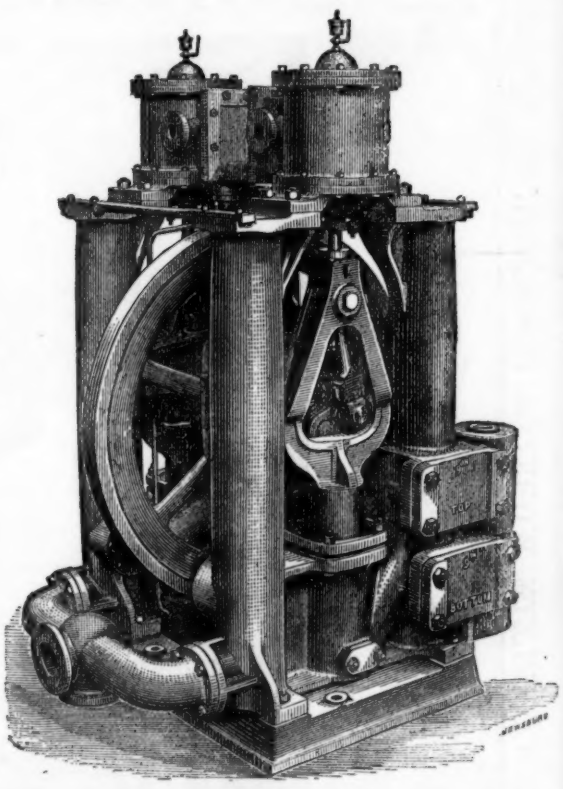

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suspend in Shaft in cases of fracture of Winding Rope

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